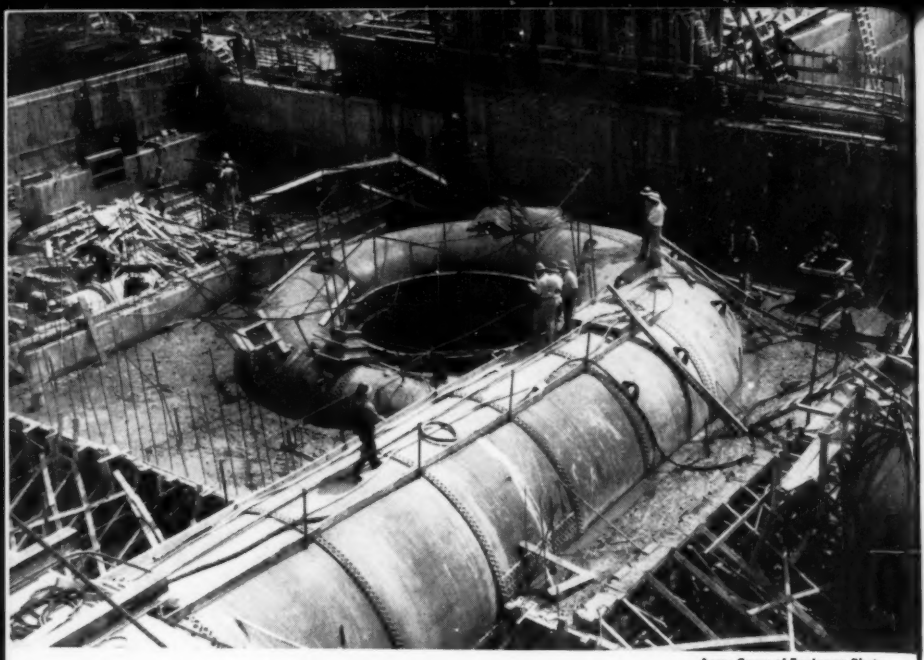
ACI News Letter

Vol. 23, No. 10 JOURNAL of the AMERICAN CONCRETE INSTITUTE June 1952



Army Corps of Engineers Photo

Scroll case embedment at Bull Shoals Dam, White River, Arkansas. Photo shows lower half of case embedded by first lift of Prepakt Concrete. Second lift covered entire case to specified height.
General Contractors—Ozark Dam Constructors

SPEAKING OF ADVANTAGES...

Two ten-foot lifts instead of ten shallow lifts—full zone encasement instead of quadrant placement—reduced formwork and surface preparation costs—twenty days placement time saved!

These are a few of the advantages made possible with Prepakt Concrete methods and materials at Bull Shoals Dam, White River, Arkansas. By pre-placing the coarse aggregate, then grouting the mass with Intrusion mortar, Prepakt accomplished full encasement of the scroll cases in much less time than that normally required for standard placement methods.

Add to these the Prepakt advantages of no setting shrinkage, low heat of hydration, high strength, and resistance to deterioration, and you have the practical answers to why Prepakt is your best choice for concrete structures.

Write today for full information on this and other types of Prepakt construction. Address the Home Office, Union Commerce Building, Cleveland, Ohio.

CONTRACTORS • ENGINEERS

PREPAKT

SPECIAL SERVICES

INTRUSION-PREPAKT, INC. THE PREPAKT CONCRETE CO.

CHICAGO • TORONTO • SEATTLE **CLEVELAND 14, OHIO** SAN FRANCISCO • PHILADELPHIA

ZURICH • PARIS • MADRID • STOCKHOLM • HELSINKI • BERLIN

ACI
News Letter Contents

June 1952

On the Cover—Chicago, Ill., where ACI will hold its regional meeting September 10-12, 1952, in conjunction with the Centennial of Engineering Convocation of Engineers, September 3-13.
—*Chicago Aerial Survey Co. photo*

Centennial of Engineering, 1952..... 3

Regional Meeting..... 4

Who's Who
- Leo H. Corning..... 6
- Boyd G. Anderson..... 6
- Eivind Hognestad..... 6
- C. P. Siess..... 6
- Raymond C. Reese..... 7
- T. Y. Lin..... 7

Conduct of Committee Work 9

Positions and Projects—ACI Members.....12

It's Boston in '53!.....16

Louis B. Weatherbee.....16

New Members.....24

Honor Roll.....27

Tools, Materials, Services..27

Synopses.....29

Discussion.....36

List of Advertisers.....38

Centennial of Engineering, 1952

During the past century, the remarkable advancement of our country has been due in a considerable degree to the contributions made by American engineering and technology. The Centennial celebration is an outstanding opportunity to commemorate the services of the engineering profession to the nation, bringing to the people of the United States and the world a more complete understanding of some of the principal reasons why the United States has reached its present high stage of development. Engineering and industry will use this opportunity to make the Centennial an occasion of national and international significance.

The Centennial, celebrating "A Century of Engineered Progress" in the United States, has three major aims directed principally to the general public and to foreign visitors and is designed to make known the contributions of engineers to our national progress. It depicts clearly the role of industry, with its mass production and distribution so essential to our high standard of living. Above all, it attempts to demonstrate that an atmosphere of freedom and competition, with competent engineering and management in industry, is essential to maintain and increase the prosperity of the nation.

There will be appropriate local and regional observances during the year throughout the United States, with the major activity in Chicago during the summer and early fall. The two principal functions at Chicago being the exposition with a dramatic pageant, and the Convocation of Engineers, all centering around the Museum of Science and Industry. The museum now houses what is generally considered to be the world's finest collection of exhibits in the fields of science, engineering and industry. The dynamic exhibits are designed for educational benefit to those with technical and scientific understanding and to be interestingly informative and educational to the general public as well.

Continued on p. 5

Regional Meeting—A Joint Event with the Structural Division, ASCE

Conrad Hilton Hotel, Chicago, Ill.

WEDNESDAY, SEPTEMBER 10

9:00 a.m.—REGISTRATION—$1.00 Registration Fee

Day left open for visits to Museum of Science and Industry, the Centennial Pageant, and other Centennial functions

THURSDAY, SEPTEMBER 11

9:30 a.m.–4:30 p.m.—FIRST TECHNICAL SESSION—PRESTRESSED CONCRETE

Chairman—
A. E. CUMMINGS, Director of Research, Raymond Concrete Pile Co.

Introductory paper bridging the gap between MIT 1951 conference on prestressed concrete and this session
MYLE J. HOLLEY, JR., Massachusetts Institute of Technology

Prestressed elements of New York Harbor Pier 57
CAPT. E. H. PRAEGER, Madigan-Hyland

Prestressed research in Massachusetts, epitomized in construction of the Endicott Street Bridge in Danvers, Mass.
J. C. RUNDLETT, Massachusetts Dept. of Public Works

Construction of the Caracas, Venezuela, bridge using the Freyssinet System
ROBERT SHAMA, Freyssinet Co., Inc.

Prestressed concrete machine foundation recently constructed at International Nickel Co., Huntington, W. Va.
A. M. KLEIN, Robert W. Hunt Co., N. Y. and J. H. A. CROCKETT, London, England

Discussion of needed research in prestressed reinforced concrete
N. M. NEWMARK, University of Illinois

Tampa Bay Bridge construction using the Lee-McCall System
W. E. DEAN, Florida State Road Dept.

Manhattanville College of Sacred Heart—Prestressed girders in dining area
J. J. CLOSNER, Preload Enterprises, Inc.

Progress in PCA research
REPRESENTATIVE, Portland Cement Assn.

General summary
ADMIRAL J. F. JELLEY, U. S. Navy, Bureau of Yards and Docks

FRIDAY, SEPTEMBER 12

9:30 a.m.–4:30 p.m.—SECOND TECHNICAL SESSION—PRECAST AND THIN-SHELL CONCRETE DESIGN AND CONSTRUCTION

Chairman—
STEWART MITCHELL, Principal Bridge Engineer, California Division of Highways

Description of thin-shell design and construction of new automobile salon in Turin, Italy
DR. PIER LUIGI NERVI, Rome, Italy

Discussion of various aspects of thin-shell design based on research for Lehigh University
DR. BRUNO THURLIMANN, former research engineer, Lehigh University, and BRUCE G. JOHNSTON, University of Michigan

Construction aspects of thin-shell structures
ANTON TEDESKO, Roberts and Schaefer Co.

Discussion of construction of thin-shell roofs
C. S. WHITNEY, Ammann and Whitney

Precast concrete boxes in New York Harbor Pier 57
E. H. PRAEGER, Madigan-Hyland.

Precast concrete in highway bridge construction
E. L. ERICKSON, Bridge Branch, Bureau of Public Roads

A progress report on fire resistance of concrete floor slabs
J. P. THOMPSON, Portland Cement Assn.

Continued from p. 3

The Convocation program will provide the opportunity of a lifetime for any engineer to reap the benefit of scholarly papers and discussions in his particular branch of the profession. He will be able also to profit from sessions devoted to other fields and techniques of engineering.

It is suggested that those attending the ACI regional meeting September 10–12, 1952, plan to bring their families and spend a few extra days, perhaps as part of a vacation, taking in the exhibits at the Museum of Science and Industry which should prove of interest to ALL. One of the outstanding highlights of the Centennial is the International Engineering Banquet to be held September 10. Special entertainment will be provided and the principal guest speaker will be internationally known.

The year 1952 marks the centennial celebration of the 100th anniversary of the founding of the American Society of Civil Engineers, the oldest national engineering society in the United States. In 1852, engineering in America was divided into two branches, military and civil. We now have many specialized branches of engineering and many national societies of engineers but all are a part of the one-time civilian or "civil" engineering profession. As such, all have a mutual interest in celebrating the Centennial of Engineering in 1952.

C. E. Wuerpel, technical director, Marquette Cement Mfg. Co., Chicago, and chairman of the ACI Technical Program Committee,was actively in charge of arranging the final program for the regional meeting to be held at the Conrad Hilton Hotel, Chicago, Ill.

ATTENTION!

The Conrad Hilton Hotel has a block of 200 rooms for ACI members attending the Regional Meeting and Centennial of Engineering in Chicago, Sept. 10, 11, 12, 1952. As all indications are that hotels will be crowded, ACI members are urged to make their plans and write for reservations as soon as possible. The Hotel cannot guarantee to accept reservations requested after August 10.

Write directly to Conrad Hilton Hotel, Chicago Ill., Attn: Mr. Edward Pelegrin, stating that reservations are requested in connection with the ACI REGIONAL MEETING.

Rates at the Conrad Hilton are as follows:

Single room:	$ 5.50—$12.00
Double room:	$ 9.50—$16.00
Twin-bed room:	$10.50—$16.00
Suites:	$20.00—$35.00

Who's Who This Month

Leo H. Corning

Leo H. Corning, manager, Structural and Railways Bureau, PCA, Chicago, Ill., is the author of "Introduction to Ultimate Load Design, p. 797, presented at the ACI convention.

Mr. Corning graduated in civil engineering and received his BS and CE degrees from Case Institute of Technology. During World War I, he served as an engineering instructor in the Coast Artillery Corps., U. S. Army. He later practiced as an architect and engineer in Florida, and served as structural engineer with the M. A. Hanna Co. of Cleveland and as engineer of design for the Water Dept. of that city. Immediately before joining PCA, Mr. Corning was structural engineer with the Foundation Co., contractors and engineers of Chicago.

He has been an ACI member since 1949 and serves on ACI Committees 318, Standard Building Code; 321, Design of Reinforced Concrete Slabs; 324, Precast Reinforced Concrete Structures. He is chairman of Committee 327, Joint ASCE-ACI Committee on Ultimate Load Design.

Boyd G. Anderson

"Why Design by the Ultimate Strength Theories?", p. 801, was Boyd G. Anderson's ACI convention presentation.

Mr. Anderson is an associate partner, Ammann and Whitney, New York, N. Y., and was previously an engineer with Charles S. Whitney, consulting engineer, and field engineer on buildings, canal locks and piers in the designing engineer section of the Bureau of Yards and Docks, U. S. Navy, on timber, steel, concrete and prestressed concrete aircraft hangars. He is a 1936 civil engineering graduate of the University of Wisconsin.

Mr. Anderson has been affiliated with ACI since 1945 and is a member of ACI Committees 312, Plain and Reinforced Concrete Arches, and 324, Precast Reinforced Concrete Structures.

Eivind Hognestad

Eivind Hognestad, research assistant professor, Dept. of Theoretical and Applied Mechanics, University of Illinois, Urbana, presented "Fundamental Concepts in Ultimate Load Design of Reinforced Concrete Members," p. 809, at the 1952 convention.

In 1947 Professor Hognestad received an appointment as a research graduate assistant at the University of Illinois where he worked on various projects pertaining to reinforced concrete research under the supervision of the late Prof. F. E. Richart and received his MS in 1949.

Professor Hognestad graduated from Norway's Institute of Technology in 1947 as a civil engineer. Following a period as a political prisoner in 1942–43, he escaped to England in 1944 and entered the Royal Norwegian Navy, returning to the Institute in 1946.

He has been an ACI member since 1947 and is a member of ASCE-ACI Joint Committees 326, Shear and Diagonal Tension, and 327, Ultimate Load Design.

C. P. Siess

C. P. Siess, research associate professor of civil engineering, University of Illinois, Urbana, writes about "Review of Research on Ultimate Strength of Reinforced Concrete Members," p. 833, an ACI convention paper.

Professor Siess graduated in civil engineering from Louisiana State University and then worked as soils engineer in the testing laboratory of the Louisiana Highway Commission. In 1937 he became special research graduate assistant in theoretical and applied mechanics at the University of Illinois where he received his MS in 1939 and his PhD in 1948.

After work with the Chicago Dept. of Subways and Superhighways and the New York Central Railroad he returned to the University of Illinois in 1941.

Dr. Siess has been an ACI member since 1936 and is very active in ACI committee work. He is chairman of ACI Committee 215, Fatigue of Concrete; member of the

Executive Group of ACI Committee 115, Research; member of ACI Committee 208, Bond Stress, and 321, Design of Reinforced Concrete Slabs; and is a member of ASCE-ACI Joint Committee 323, Prestressed Reinforced Concrete. He is also affiliated with ASTM, ASCE, SESA, Highway Research Board, Sigma Xi, Tau Beta Pi, Phi Pappa Phi, Omicron Delta Kappa and Phi Eta Sigma.

Raymond C. Reese

Raymond C. Reese, author of "Design of Sections by Ultimate Load Theories," p. 865, presented this paper at the ACI convention.

Mr. Reese, who is a consulting engineer, Toledo, Ohio, was educated in engineering at Massachusetts Institute of Technology, and Pierce Hall, Harvard. He then spent several years as an industrial engineer with the General Electric Co. Since 1922 he has been in private practice as a consulting engineer.

An ACI member since 1936, he is a member of ACI Committee 208, Bond Stress; 318, Standard Building Code; and chairman of Committee 315, Detailing Reinforced Concrete Structures. Mr. Reese is also a member of Joint ASCE-ACI Committee 326, Shear and Diagonal Tension, and 327, Ultimate Load Design.

T. Y. Lin

"Load Factors in Ultimate Design," p. 877, was presented at the ACI convention by T. Y. Lin, associate professor of civil engineering, University of California, Berkeley.

After graduating from Chiaotung University, China, Professor Lin received his MS degree in civil engineering at the University of California in 1933. Returning to China, he worked with the Chinese National Government Railways, becoming chief of design and planning for the Yunnan-Burma Railway. In 1946 he joined the faculty of the University of California, where he now also serves as associate engineer, Institute of Traffic and Transportation Engineering.

An ACI member since 1950, Professor Lin is a member of ACI Committee 314, Rigid Frame Bridges, and chairman of the ASCE Committee on Bridge Loadings.

GET THESE ADVANTAGES BY ADDING

SOLVAY CALCIUM CHLORIDE TO YOUR CONCRETE

- Cuts setting time in half.
- Reduces curing period; permits quicker use.
- Increases both early and ultimate strength.
- Offsets effects of low temperatures.
- Can be used with regular, air entrained, high early, colored or low heat cement.

SOLVAY Calcium Chloride

√ ADDS EXTRA STRENGTH
√ SPEEDS OPERATIONS
√ CUTS DELAYS

FREE BOOK GIVES FULL DETAILS. "The Effects of Calcium Chloride on Portland Cement" is offered by Solvay to architects, engineers, contractors — anyone who works with concrete. It is filled with authentic information and answers all your questions about the use of Calcium Chloride in concrete. For your free copy, write on your business letterhead.

SOLVAY SALES DIVISION
Allied Chemical & Dye Corporation
40 RECTOR STREET, NEW YORK 6, N. Y.
Dept. JC-6

DAREX AEA contains a catalyst which makes available more of the inherent strength of portland cement. This minimizes or prevents any loss in strength resulting from entrained air . . . makes lean mixes stronger than plain concrete!

Equally important, concrete made with DAREX AEA places easier and faster, finishes better, has better surface texture, is many times more durable when exposed to freezing and thawing.

Readymix concrete plants everywhere can furnish concrete made with DAREX AEA. Ask your supplier . . . or write to us for

20 Page Illustrated Booklet, Now Available

DAREX *AEA* *was used in all the concrete in the 17,000 units of the vast Lakewood Park project in Long Beach, California.*

CONSTRUCTION SPECIALTIES DIVISION

DEWEY and ALMY Chemical Company

Cambridge 40, Mass. • Chicago 38 • San Leandro, Calif. • Montreal 32

Conduct of Committee Work*

The Board of Direction of the Institute assigns a part of its administrative and technical duties to the Technical Activities Committee, the Standards Committee, the Awards Committee and to various technical committees. Each of these committees is appointed by the Board, acts as its agent, and is responsible to the Board for performance of functions assigned to it. Technical committees, authorized by the Board on recommendation of the Technical Activities Committee, are assigned specific tasks in the field of information on improvement of the design, construction, manufacture, use and maintenance of concrete structures and products. Actions of all committees are subject to the review and approval of the Board.

TECHNICAL ACTIVITIES COMMITTEE

1. The Technical Activities Committee shall be composed of nine members: a chairman appointed annually by the Board of Direction, the President and the Secretary-Treasurer of the Institute, and six other Institute members appointed for two-year terms in such a way that three new or reappointments shall be made annually. The Committee chairman, the President and the Secretary-Treasurer of the Institute shall constitute the Committee's executive group for decisions between meetings.

2. The Committee shall have responsibility for the content of the Institute's convention program, for its technical publications including their editorial treatment, for the assignments, nomination of personnel and functions of technical committees, their reports, papers, written discussions and other contributions, and for the initiation of work leading to the proposal of Institute Standards, but not for the critical review, approval and promulgation of new or revised Standards (see Standards Committee). The Committee shall be responsible, however, for the periodic review of existing Institute Standards and at intervals of not to exceed four years shall recommend the appointment of such technical committees as may be needed to determine the need for continuance or revision of each existing standard.

3. The Committee shall recruit for service in an advisory capacity consultants, chosen for their special knowledge and competence in the many fields of membership interest. These consultants may be requested, as individuals or as groups, to advise the Committee on acceptability of contributions offered for publication, to explore sources of information, or to aid in determining membership viewpoints on all projects coming within the Committee's responsibilities.

4. The Committee is expected to hold at least three meetings annually, one being at the time of the annual convention. Meetings shall be arranged on request of any five of its members or by the executive group.

5. The Committee shall prepare an annual report of its activities for submission to the Board.

STANDARDS COMMITTEE

1. The Standards Committee shall consist of a chairman appointed annually by the Board of Direction and six other voting members appointed for three-year terms in such a way that two new or reappointments shall be made annually. The Secretary-Treasurer of the Institute shall be a non-voting member and shall act as secretary of the Committee. In reviewing any proposed standard, the membership of the Committee shall be augmented by the chairman (or member designated by the chairman) of the technical committee proposing the standard, but this augmenting member shall not vote as a member of the Standards Committee.

2. The Committee shall be responsible for the critical review, approval or disapproval of such new or revised Standard Specifications, Standard Practice Recommendations or Standard Definitions as may be referred to it by technical committees through the Secretary-Treasurer of the Institute.

3. The Committee shall adopt any means it deems expedient to satisfy itself of the adequacy of the proposed standard. These means may include correspondence with

*Revised by the Technical Activities Committee Feb. 25, 1952; ratified by the Board of Direction by letter ballot April 7, 1952. This section will appear in the next *Directory* issue.

competent critics, appointment of a subcommittee of its own membership for study, hearings which may be scheduled at an annual convention or limited distribution to selected agencies or individuals.

4. When a proposed new or revised standard has been released by the Standards Committee by approval of four or more of its members, it shall be published as information in the News Letter or as a special publication not less than 30 days prior to an annual convention of the Institute at which the originating technical committee shall present it for adoption. If approved by two-thirds of members voting at the convention it shall be submitted by reference to secret letter ballot of the Institute membership. The standard shall become effective upon ratification by two-thirds of those returning letter ballots within a period specified by the Secretary-Treasurer of the Institute, but not less than 30 nor more than 90 days after the mailing of the ballot. When a Standard has become effective it shall be published in the *Proceedings* or in a supplement thereto.

5. An amendment to a proposed standard presented on the floor of the convention shall be sustained only by a nine-tenths vote of members voting. If sustained, the amended standard shall be submitted to letter ballot as provided above.

6. In event that four or more members of the Committee do not approve a proposed standard, it shall be referred back to the originating technical committee with a statement of the reasons for rejection and a request for reconsideration. Rejected standards may be resubmitted to the Standards Committee when accompanied by a statement from the originating committee setting forth the results of the reconsideration of the proposed standard.

7. In event of deadlock or of apparent obstruction in the outlined procedure, the Standards Committee or the technical committee originating the proposed standard may appeal to the Board of Direction.

AWARDS COMMITTEE

1. The Awards Committee shall consist of five members of the Institute, including the chairman, all appointed by the Board of Direction for two-year terms with the Secretary-Treasurer of the Institute acting as secretary of the Committee without vote. The chairman shall serve as such for a one-year term. The membership of the Committee shall not be announced publicly except by special vote of the Board of Direction.

2. The Awards Committee shall recommend to the Board candidates for receipt of the Wason Medals, the Turner Medal, the ACI Construction Practice Award, the Alfred E. Lindau Award and such other medals or awards as may be established, all in accordance with the conditions prescribed by the donors or by the Board.

3. In the event that a member of the Awards Committee becomes eligible for consideration for any of the medals or awards, the Committee shall so notify the Executive Committee of the Board of Direction, which will then appoint a substitute for the member so eligible.

TECHNICAL COMMITTEES

1. Technical committees shall be authorized by the Board of Direction and the chairmen shall be appointed by the Board.

Members of technical committees, other than the chairmen, shall be nominated by the Technical Activities Committee and shall be appointed by the President. Chairmen of technical committees shall be members of the Institute. Specially qualified individuals, not members of the Institute, may be appointed to technical committee membership.

2. Each technical committee authorized by the Board of Direction shall receive from the Technical Activities Committee an explicit statement of its scope and assignment, in writing.

3. Each committee, when organized, shall plan its own procedure. The chairman may advise all members of the committee in writing of the procedure to be followed or the procedure may be adopted by committee action at a formal meeting. In either case, copies of the correspondence or notices and minutes of the meeting shall be sent to the chairman and the secretary of the Technical Activities Committee.

4. Committee meetings are to be encouraged and, wherever possible, at least

one regular meeting of a technical committee should be held each year.

Members of committees shall be kept informed by the chairman or secretary of activity and progress within the committee through correspondence and minutes of meetings, copies of which shall be sent to the chairman and secretary of the Technical Activities Committee.

5. Technical committees shall serve until reorganized or discharged by the Board of Direction, on recommendation of the Technical Activities Committee.

6. Each technical committee chairman shall submit annually a brief written report of activity to the Technical Activities Committee.

7. In transmitting a technical report on its assignment a committee shall submit also a supplementary report for the use of the Technical Activities Committee comprising recommendations for further studies and for additions to or changes in committee membership on the basis of work done.

8. Accompanying its technical report, as submitted to the Secretary-Treasurer of the Institute, the committee shall furnish a statement of the results of the committee's formal action on the report in either of the following forms:

a. This report was submitted to letter ballot of the committee which consists of _____ members; _____ members returned their ballots of whom _____ have voted affirmatively and _____ negatively.

b. This report was approved in form and substance as here submitted by the following members of the committee (followed by names of the approving members).

9. Committee reports or parts thereof other than proposed standards shall be released for publication only through the Technical Activities Committee of the Institute. Proposed standards shall be released for publication as outlined in "Standards Committee".

DISTRIBUTION OF TECHNICAL COMMITTEE REPORTS

1. Except as provided with reference to proposed standards (see "Standards Committee") the distribution of committee reports shall be in the hands of the Technical Activities Committee. In general a committee report will have a preliminary, very limited, distribution to critics named by the Technical Activities Committee and subsequent publication complete or in part, as the Technical Activities Committee shall direct.

TECHNICAL COMMITTEE EXPENSES AND SPECIAL FUNDS

1. The Secretary-Treasurer will honor vouchers from a committee chairman for postage expense incurred in the work of his committee, and will supply committee stationery on request. Other committee expenses will not be assumed by the Institute unless previously authorized specifically by the Board.

2. Special committee funds, when their solicitation has been authorized by the Board, shall be deposited to the Institute's account through the Institute's Secretary-Treasurer and shall be disbursed on vouchers signed by the chairman of the committee for whose work the fund was created.

THE JOURNAL AND THE CONVENTION IN RELATION TO TECHNICAL COMMITTEE WORK

The work of the Institute is continuous throughout the year. An annual convention and 10 JOURNAL issues present a series of 11 forums. One of the important considerations in inaugurating the publication of the *Proceedings* periodically in the JOURNAL was to increase the scope and volume of Institute work, to give consideration to more papers and committee reports than can be considered adequately in the limited periods of a convention. Thus, technical committees will not assume that a report made available to the Institute is necessarily for presentation at the next convention. It is the policy of the Institute through the Technical Activities Committee to relieve the strain of overcrowded convention sessions. Committees should submit their reports as promptly as possible for consideration by the Technical Activities Committee or, if a proposed standard is involved, by the Standards Committee. Thus, the Technical Activities Committee may, if a committee report is available early enough and if the subject matter is appropriate, schedule it for convention presentation.

Positions and Projects — ACI Members

Recent appointment to an ACI technical committee

Committee 325, Structural Design of Concrete Pavements for Highways and Airports

E. A. Finney, Chairman,
Assistant Testing and Research Engineer in Charge of Research.
Highway Research Laboratory,
Michigan State Highway Department,
East Lansing, Michigan.

Murphy named department head

Glenn Murphy has been named head of the Department of Aeronautical Engineering at Iowa State College, Ames. Dr. Murphy, who has been serving as professor of theoretical and applied mechanics, will retain some of his responsibilities in that field, and in addition will remain as senior engineer in the Institute for Atomic Research.

Hanna appointed vice-president

W. C. Hanna, for many years chief chemist, California Portland Cement Co., Colton, Calif., has been appointed vice-president in charge of technical development.

Fava wins construction prize

Alberto S. C. Fava recently won first prize in a competition held by the Camera Argentina de la Construccion which invited papers on "Studies of Problems of Construction in Argentina." His paper was entitled "The Theory and Practice of the Intentional Incorporation of Air in Portland Cement Concrete." C. E. Wuerpel, technical director, Marquette Cement Mfg. Co., Chicago, Ill., introduced air entrainment to Argentina and wrote the first project specifications which contemplated the use of air entrainment. Mr. Fava, chief, Concrete Section, Laboratorio de Ensayo de Materiales e Investigaciones Tecnologicas, was in charge of concrete mixture designs and inspection of work on this project. With the assistance of data and drawings furnished by Mr. Wuerpel, Mr. Fava was able to build an exact replica of the Washington Air Meter and mechanical dispensing equipment and other equipment and apparatus related to the proper use of air entrainment.

Marane constructs dam in Turkey

Alfred C. Marane, construction engineer, Savannah District, Corps of Engineers, is now employed by Chas. T. Main, Inc., Boston, Mass., as construction engineer in charge of construction of Sariyar Dam, powerhouse and tunnel in Turkey.

Rawhauser on TCA assignment

Clarence Rawhauser is serving as dams design engineer with the Central Water and Power Commission of India, New Delhi, under the Point IV program of the Technical Cooperation Administration of the U. S. State Department. Mr. Rawhauser was formerly an engineer in the Dams Branch, Bureau of Reclamation, Denver, Colo. In his present position he is assigned to the Foreign Activities Office of the staff of the Commissioner of Reclamation, Washington, D. C.

1952 meeting of Canadian building officials

The meeting of Canadian building officials held in Windsor, Ontario, May 9-10, 1952, was sponsored by the Associate Committee on the National Building Code. The purpose of this meeting was to provide the opportunity for Canadian building officials to discuss revisions to the National Building Code and to exchange views on the problems confronting building inspectors. This year the meeting had added significance, as a revised edition of the National Building Code will be released this summer.

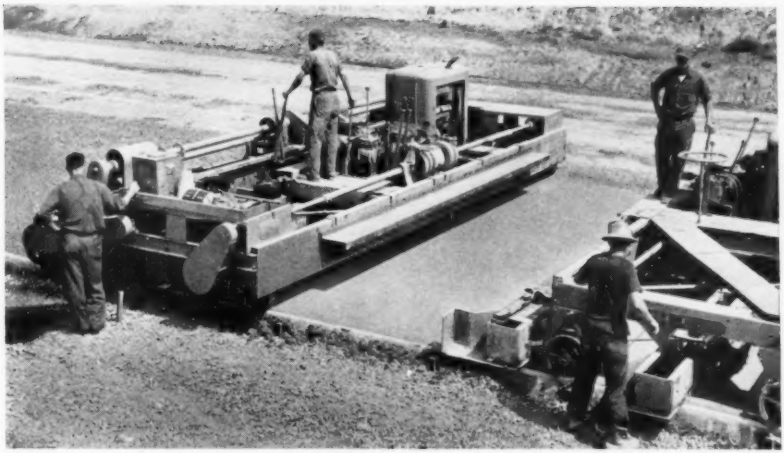
Diener succeeds Lindsay

F. P. Diener, chemical engineer, Universal Atlas Cement Co., was appointed director of tests and research, to succeed G. L. Lindsay, deceased.

Dale consults in Brazil

Frederick A. Dale, consulting engineer, Cashiers, N. C., is in Brazil on a three-month assignment for Burns and Roe, Inc., N. Y. His work consists of consultation on hydroelectric development for Parana, Brazil.

Continued on p. 16



Precision Slab -- Faster and at Lower Cost --with Jaeger 3-Screed Paving Team

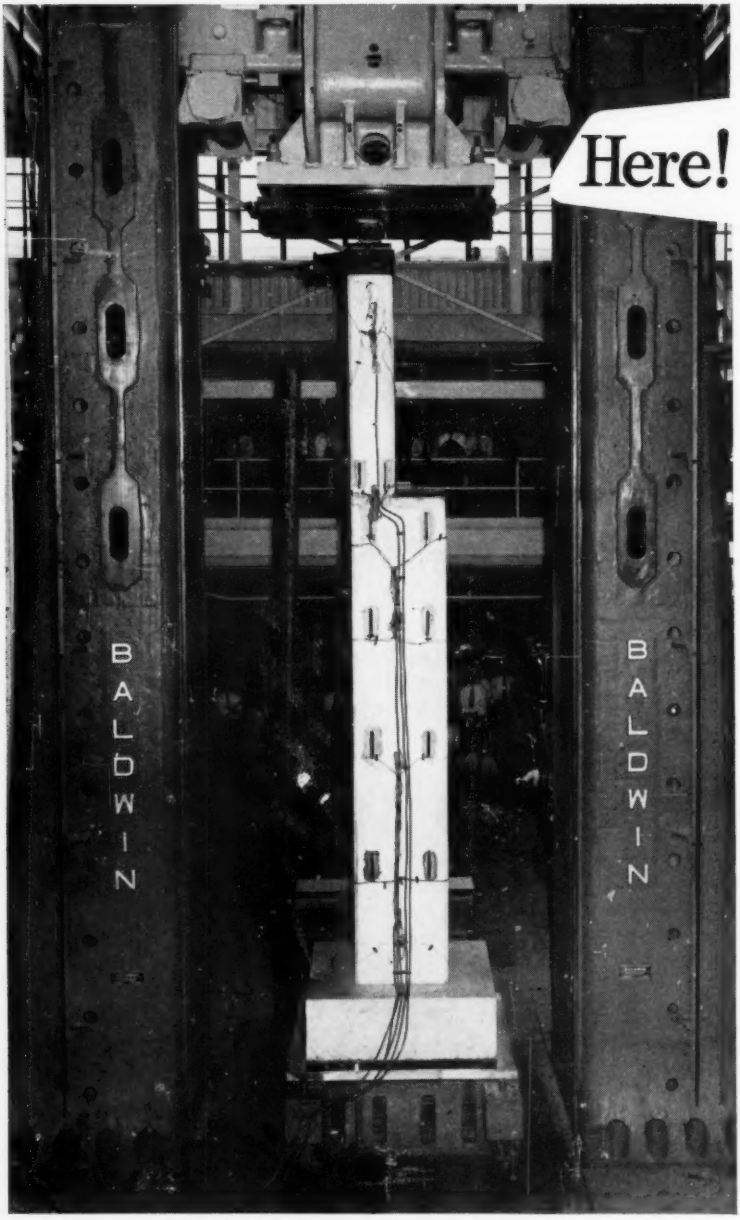
Machine #1—Jaeger Screw-Screed Spreader that remixes and compacts, spreads, strikes off to approximate grade, *then makes precision-metering strikeoff with its oscillating screed.* Machine #2—Jaeger Type "X" Finisher with transverse front screed and diagonally adjustable rear screed.

It's a 3-screed paving team that saves costly hand labor and costlier paver delays, has also eliminated need for a second finisher on a number of high speed paving jobs. Photo at top shows Screw-Screed Spreader ahead of Finisher. Note semi-finished, exactly-metered surface. Photo at left shows how spreader metering action assures just right roll of material ahead of finisher screeds—no excesses, no deficiencies, uniform compaction.

Get full information—Write for Catalogs CSS-0 and FX-8

THE JAEGER MACHINE COMPANY **510 Dublin Avenue Columbus 16, Ohio**

Builders of Paving Machines. Mixers, Truck Mixers, Compressors, Pumps, Hoists and Towers

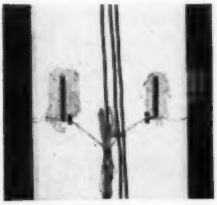

Here!
BALDWIN
BALDWIN

THE BIGGEST AND THE SMALLEST

BALDWIN TESTING DEVICES

TEAM UP TO TELL MORE ABOUT CONCRETE

The 5,000,000 pound push available in this Baldwin Universal Testing Machine at the Bureau of Reclamation Laboratory, Denver, is helping to "squeeze" additional information out of *full-scale* concrete members and structures, expanding the pool of engineering knowledge in the concrete design field. Here, a 22-foot high reinforced concrete step column is being tested in compression. Failure of the upper portion occurred at a total load of 1,675,000.



SR-4 GAGES®
REVEAL STRESS PATTERNS

Another Baldwin Testing device . . . the SR-4 strain gage . . . extends the design-benefits of the test. During the entire duration of load application, these SR-4 gages, mounted both externally and internally, telegraphed dozens of local stress-strain stories to a central recording station. Result . . . a complete picture of the stress pattern in the column and invaluable data for design-improvements of concrete structural members and assemblies.

You will find Baldwin Concrete Testing Machines helpful aids in plant, highway and construction laboratories for routine and specification testing. For further information on the advantages of these Concrete Testing Machines you are invited to write for the following bulletins:

Bulletin 327—on the Baldwin 100,000 lb. Concrete Testing Machine
Bulletin 318—on the Baldwin 300,000 lb. Concrete Testing Machine

BALDWIN-LIMA-HAMILTON CORPORATION—Philadelphia 42, Pa., U. S. A.
Offices: Chicago, Cleveland, Houston, New York, Philadelphia, Pittsburgh, San Francisco, St. Louis, Washington. *In Canada:* Peacock Bros., Ltd., Montreal

BALDWIN-LIMA-HAMILTON

TESTING HEADQUARTERS

Continued from p. 12

Huber nominated ASCE president

Walter L. Huber, hydraulic and structural engineer, San Francisco, Calif., has been nominated for president of ASCE to take office in October. Mr. Huber has been a consulting engineer in private practice continuously since 1913 and has been on many boards and advisory commissions serving federal, state and local agencies. He has been an ACI member since 1929.

Yost receives award

Harold W. Yost, Phoenix, Ariz., received the Sidney Bedell award at the Arizona Sewage and Water Works Assn. convention for his work in planning an expanded water and sewage project for Phoenix.

NAHO to hold conference

The National Association of Housing Officials is planning a conference to be held at the Hotel Statler, Buffalo, N. Y., October 14–17, 1952. An exhibit will be held in connection with this conference.

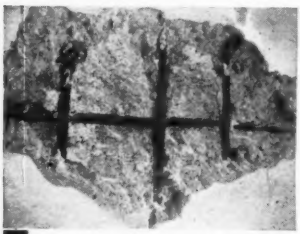
It's Boston in '53!

The competitive spirit of our Boston members is revealed in the early and vigorous efforts of the local committee to plan the 1953 annual convention as an outstanding attraction. Members attending the Cincinnati convention last February will remember Bob Gray of Cambridge, Mass., pinning a plastic lobster on everyone he could reach as a reminder that "It's Boston in '53"!

As this item goes to the printer the local committee is meeting on June 4 in Boston with Acting Secretary-Treasurer Van Atta.

Louis B. Weatherbee

Louis B. Weatherbee, a consultant and representative for Texas Industries, makers of lightweight materials for concrete, died April 11. In 1920 he worked with G. S. Hayde, Kansas City, Mo., to perfect a light concrete that would be as strong as stone. Mr. Weatherbee had been an ACI member since 1950.



Typical example of spalling. Note corrosion of reinforcing rods exposed by disintegrating concrete.

Reinforced with meshing, the area is restored with gun-applied RESTO-CRETE* by Western Waterproofing Co.

FOR *Lasting* CONCRETE RESTORATION

Specify GUN-APPLIED

RESTO-CRETE*

by WESTERN WATERPROOFING CO.

Sound engineering methods, finest materials, trained technicians and over 35 years' experience assure the job will be done *right* when you specify Western. All work done under contract, fully insured, performance guaranteed. **T. M. Reg.*

- Protection from Water Damage (above or below ground, interior or exterior)
- Building Restoration • Tuckpointing

NO MATERIALS FOR SALE • NATIONWIDE SERVICE

for specific data, write:

WESTERN WATERPROOFING CO.

Engineers and Contractors

1223 Syndicate Trust Bldg. • St. Louis 1, Mo.

A Missouri Corporation Giving Nationwide Service

BRAB prepares construction conservation study report

The Building Research Advisory Board is preparing a final report for the study of conservation in building construction for the DPA. The study will produce a framework for long-term conservation equivalent to a guide for the general advancement of building technology. A great deal of time was devoted in the study to examination of the standards and practices of federal construction agencies.

Among the members of the Advisory Panel on Structural Engineering who helped in this study are: A. Amirikian, Bureau of Yards and Docks, Washington, D. C.; Leo H. Corning, PCA, Chicago, Ill.; Paul E. Jeffers, structural engineer, Los Angeles, Calif.; Frank Kerekes, Iowa State College, Ames, Iowa; C. A. Metz, Shaw, Metz and Dolio, Chicago, Ill.; D. E. Parsons, National Bureau of Standards, Washington, D. C.; Harry C. Plummer, Clay Products Institute, Washington, D. C.; A. T. Waidelich, The Austin Co.; Cleveland, Ohio; C. S. Whitney, Ammann and Whitney, New York, N. Y.

CRETE-DRISEAL*

*Economical—one application—brush or spray
*Repels water on poured or precast concrete masonry brick—block, etc.
*Will not discolor
*Helps to prevent staining and discoloration
*Not a complete seal—permits concrete to breathe for better insulation
*Acts as a curing compound when applied to green concrete
*A development of Dow Chemical and Taylor-Williams Laboratories
*Gallon covers 200 to 500 sq. ft. depending upon material covered
*Ready to use as delivered

Dealers Wanted — Phone 5-9209

Williams Form Engineering Corp.
1501 Madison Ave., Grand Rapids, Michigan
Manufacturers of Concrete Form Hardware

PROFESSIONAL CARD

L. COFF, Consulting Engineer
198 Broadway, New York 7, N. Y.
PRESTRESSED CONCRETE STRUCTURES
Design, Estimates,
Construction Methods, Supervision

Turner Construction Co. celebrates its 50th anniversary

On May 6 the Turner Construction Co. celebrated its 50th anniversary at a dinner in New York attended by officers, directors and staff members.

H. C. Turner, Jr., president, stated that the company's half century volume of business totals more than a billion dollars. At first the company pioneered and specialized in the construction of reinforced concrete structures of all kinds. By the end of the first World War, in addition to a continuing large industrial volume, the company expanded the scope and character of its work to include finely finished buildings such as schools, libraries, hotels, apartments, office buildings, hospitals, and theatres.

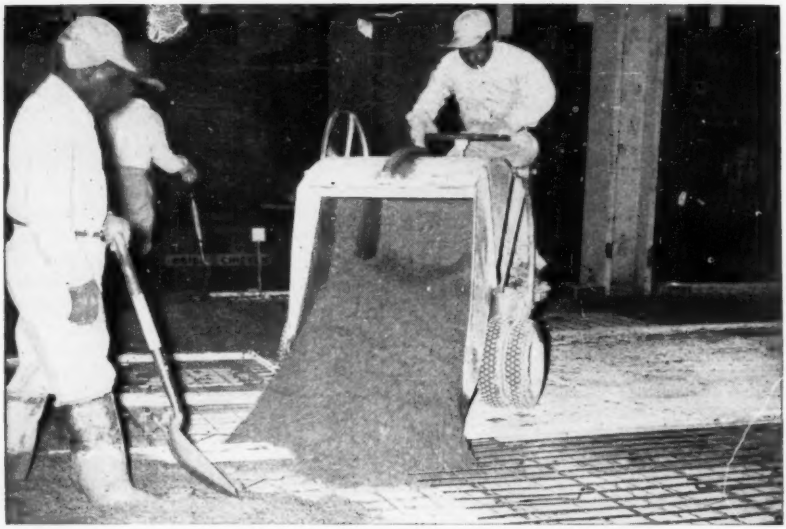
Structural engineering conference

The University of Illinois Department of Civil Engineering in cooperation with the Division of University Extension is sponsoring a structural engineering conference to be held at the University of Illinois, Urbana, November 12–14, 1952. The theme of this conference will be "New Trends in Structural Design." The program will be spotlighted with a number of addresses by outstanding structural engineers and will have the added attraction of some instructional periods devoted to newest developments in the structures field.

Seeger elected president

O. H. Seeger, general manager for Harry Wellnitz, Columbus, Ohio, recently was elected president of the Columbus Concrete Block Manufacturers Assn. Mr. Seeger had been serving as vice-president of the association.

COFAR...The Reinforcement That Forms



Cofar is structural reinforcement and form combined. It provides the ultimate in reinforced concrete design and construction

Cofar Saves Steel

Permits monolithic continuous slab design; reduces framing by reducing slab deadweight.

Cofar Saves Cement

Eliminates ineffective concrete below reinforcement, yet allows for full effective design depth.

Cofar Saves Wood Forms

Cofar *does* the forming job . . . makes any other forms unnecessary.

Cofar Saves Time

Furnished cut to fit your building frame, with immediate working surfaces for your trades, Cofar allows for fastest possible concrete placing.

What Cofar Is:

High-strength, deep-corrugated steel for main positive reinforcement; with welded transverse T-wires for temperature reinforcement.

What Cofar Does:

Provides all-positive steel (replacing conventional re-bar) in concrete slabs —up to 14-foot span—with the Cofar reinforcement forming the structural slab as well, with less total weight than wood forms.

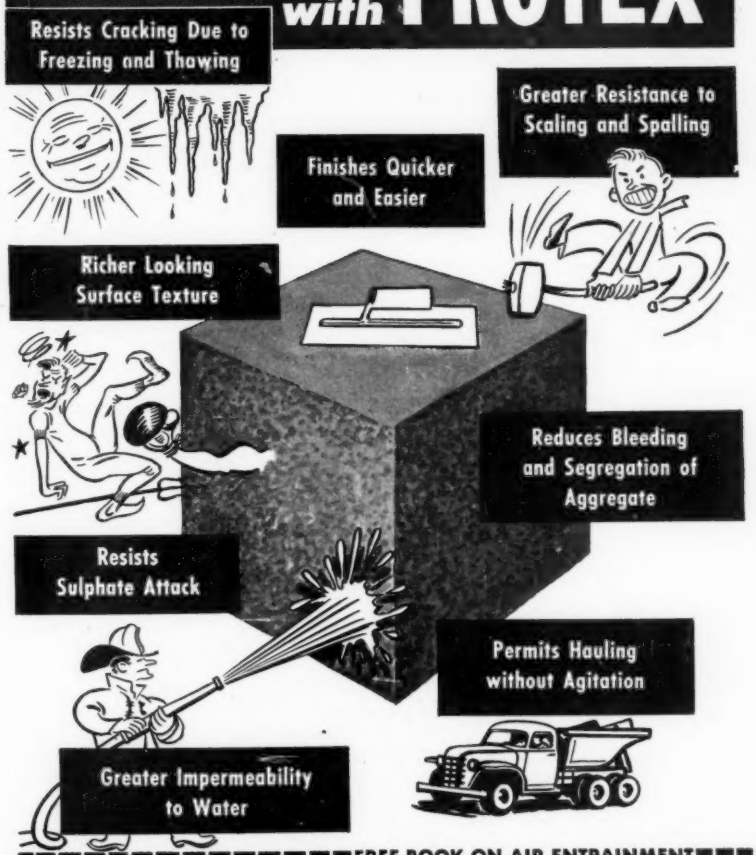
For Complete Data:

For technical information, data on design and application, estimates and cost figures, write Dept. 15-7.

GRANCO STEEL PRODUCTS COMPANY

(Subsidiary of Granite City Steel Company) • Granite City, Illinois

Get ALL the Advantages of Air-entraining with PROTEX


Resists Cracking Due to Freezing and Thawing
Greater Resistance to Scaling and Spalling
Finishes Quicker and Easier
Richer Looking Surface Texture
Reduces Bleeding and Segregation of Aggregate
Resists Sulphate Attack
Permits Hauling without Agitation
Greater Impermeability to Water

FREE BOOK ON AIR ENTRAINMENT

FOR LOWER FINISHED COST PER YARD OF CONCRETE . . . USE **PROTEX AEA**

AUTOLENE LUBRICANTS CO.
Industrial & Research Division, Denver 9, Colorado
Please send me your book, "Facts on Modern Placement of Concrete Through Air Entrainment."
*Name*_____
*Address*_____

Journals in Microfilm

ACI members and JOURNAL subscribers may obtain the two most recent completed *Proceedings* volumes (including discussion) in microfilm. For those with whom storage of technical literature is critical and who have equipment for reading microfilm this is an economical means of maintaining a file of ACI literature. *Proceedings* V. 46, Sept. 1949 to June 1950, including discussion, is $3.90. *Proceedings* V. 47, Sept. 1950 to June 1951, will be available soon at about the same price. Order direct from

University Microfilms
313 N. First St.
Ann Arbor, Michigan
Cable address: Microfilms

Jones retires

Paul A. Jones is retiring as head of USBR's Construction Administrative Div., Denver, Colo., after 37 years with the Bureau. His many irrigation and reclamation assignments include the Umatilla Project, Shoshone Project, and Kittitas Division of Yakima Project. He was chief inspector on construction of Hoover Dam and resident engineer on the Gila Project. Mr. Jones was also in charge of investigations and preliminary work on Hungry Horse Dam.

Johnson honored

Robert C. Johnson, president, Siesel Construction Co., Milwaukee, Wis., was one of eight nationally known engineers and industrialists who were honored for outstanding accomplishments in their fields at the University of Wisconsin Engineers' Day, May 2.

Grinter appointed committee member

L. E. Grinter, dean of the graduate school and director of research, University of Florida, Gainesville, has been appointed a member of the Committee on Equipment and Supplies of the Department of Defense Research and Development. Dr. Grinter has served the committee since May 1949 as chairman of the Panel on Heavy Equipment and Engineering Construction.

International symposium on the chemistry of cement

The papers to be presented at the International Symposium on the Chemistry of Cement, London, England, September 15–20, 1952, will cover the whole field of cement chemistry. Topics to be discussed are the constitution of portland cement, setting and hardening of portland cement, special cements, and applications of research. Among the contributors to the program are: A. Allan Bates, R. H. Bogue, A. R. Collins, W. C. Hansen, Herbert Insley, F. M. Lea, Harold H. Steinour, Myron A. Swayze and T. Thorvaldson.

Membership certificates

Repeated but infrequent requests for membership certificates indicate that enough members may want them to warrant having them made. At its fall meeting, the Board of Direction authorized the Secretary to determine through this notice whether or not the Institute would be justified in going to the expense of having the necessary work done.

It is estimated that certificates suitable for framing can be furnished ACI Members at a cost of not over $3.50. Those interested are requested to clip the attached coupon and mail it to Institute headquarters. *Please do not send money until billed.* If there are not enough interested, the Institute would not be justified in supplying certificates to a few at a loss.

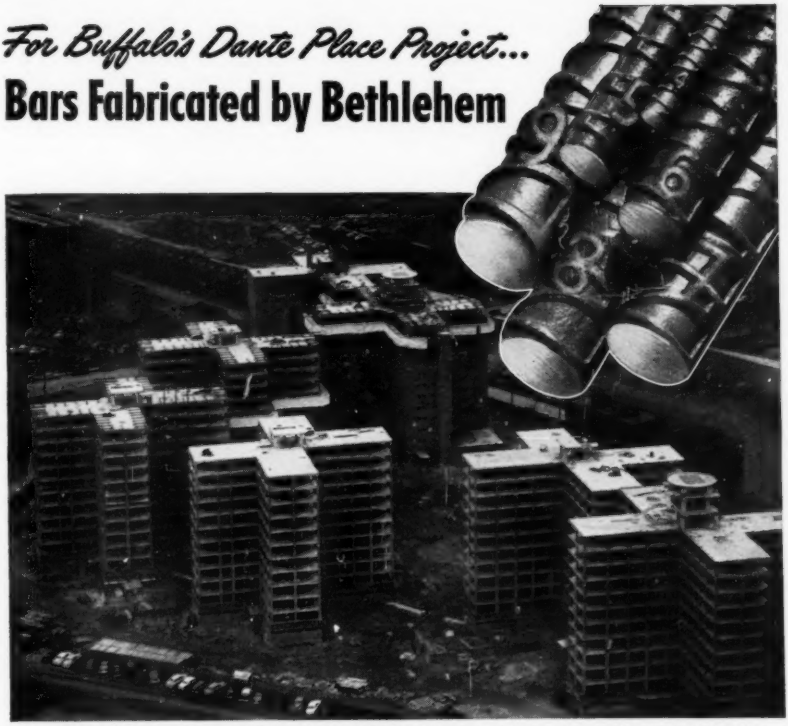
American Concrete Institute
18263 W. McNichols Road
Detroit 19, Mich.

Gentlemen: Please place an order for one membership certificate to be furnished provided enough members buy them to make it worthwhile at a cost not to exceed $3.50.

Signed.....

For Buffalo's Dante Place Project...

Bars Fabricated by Bethlehem



Dante Place Project, now under construction, is a part of Buffalo's redevelopment program in a run-down waterfront neighborhood. *Architect:* Backus, Crane and Love, Buffalo. *Consulting Engineer:* James N. DeSerio, Buffalo. *Contractors:* John W. Cowper Company, Buffalo, and Corbetta Construction Company, Inc., New York City.

Built on a 6½-acre site near the Niagara River's mouth, the $6 million Dante Place Project will offer 616 apartment units in its seven buildings. The concrete superstructures contain 1951 tons of Bethlehem Reinforcing Bars.

These bars—made from 100 pct new-billet steel—were carefully fabricated in Bethlehem's nearby Lackawanna Plant to meet the exact specifications for this impressive project. Sheared to proper length and accurately shaped on bending machines, they reached the job-site bundled, tagged, and with bar lists included.

Specially designed lugs, high and closely spaced, give Bethlehem Reinforcing Bars firm anchorage in concrete. These lugs minimize slippage at working loads and check the formation of wide tensile cracks.

Bethlehem's fabricating service can speed and strengthen your next concreting job. Call our nearest sales office for full information. Or write to us at Bethlehem, Pa.

BETHLEHEM BAR FABRICATING SHOPS

Boston, Mass.	Sparrows Point, Md.
Elizabeth, N. J.	Lackawanna, N. Y.
Philadelphia, Pa.	Clearing, Ill.
Johnstown, Pa.	St. Paul, Minn.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

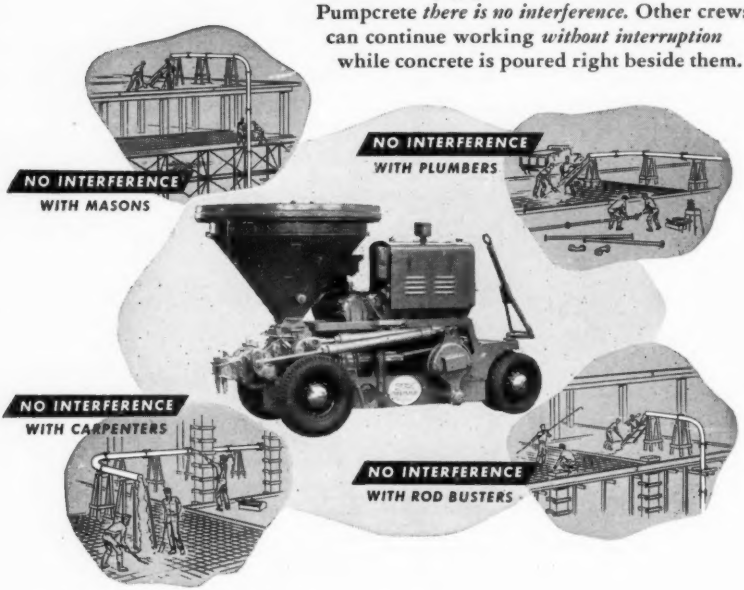
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM REINFORCING BARS

Are you Being Penalized for INTERFERENCE?

You're not if you're using Rex Pumpcrete® . . . concrete by pipe line . . . because with Pumpcrete *there is no interference.* Other crews can continue working *without interruption* while concrete is poured right beside them.



- No delays waiting for various trades to finish up.
- No buggies, buggy runs or heavy equipment to move.
- No runway storage problem.
- Move placing equipment from floor to floor in 15 minutes! Just extend the pipe.
- Eliminate trestling, scaffolding, towers and other expensive preparatory costs.
- No cleanup problems.
- Place all the concrete *where* you want it, when you want it, in a smooth, steady flow.

Get the details from your local Rex distributor, or write to Chain Belt Company, 4713 W. Greenfield Ave., Milwaukee 1, Wis.

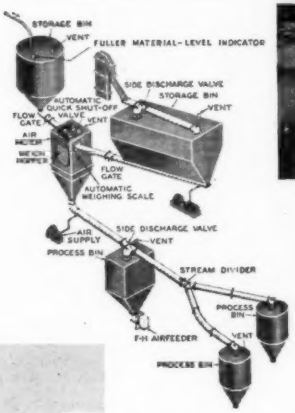
CHAIN BELT COMPANY REX ® CONSTRUCTION MACHINERY . . .

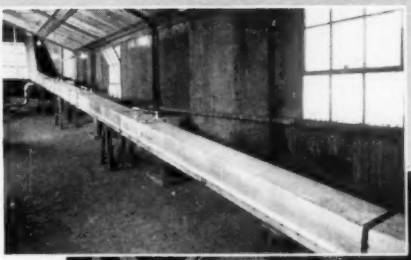
A SAFE • SIMPLE • ECONOMICAL SYSTEM

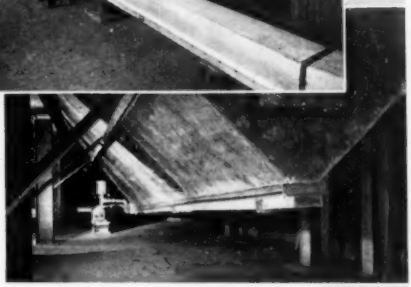
for moving material

the F-H AIRSLIDE®

no moving parts







For moving fine dry material, the F-H Airslide in your plant means safety, simplicity and economy because only the material moves. No moving parts to jam or break. No dust hazards . . . and none of the straight-line limitations of mechanical conveyors.

The F-H Airslide fluidizes the material and transports it by gravity . . . a great power-saving feature because only a small volume of air at low pressure is required.

Invite a Fuller engineer to show you how the material handling efficiency of the F-H Airslide can reduce your handling costs. There is no obligation, of course.

Fuller

FULLER COMPANY
Catasauqua, Pennsylvania
Chicago 3—120 So. LaSalle St.
San Francisco 4—420 Chancery Bldg.

Fuller Company is the exclusive manufacturer of air gravity conveyors, except for use in motor vehicles, under Huron Portland Cement Company U. S. Patent Nos. 2,316,814, 2,517,837, 2,527,394, 2,527,455, 2,527,466, 2,527,488 and Patents Pending.

FH-27

New Members

The Board of Direction approved 56 Individual, 2 Corporation, 16 Junior and 14 Student Memberships for April. With adjustments for losses—resignations, deaths, nonpayments—the total membership May 1 was 5714.

Individual

ALLE, JOHN, Philadelphia, Pa. (Struct. Designer, Catalytic Constr. Co.)
ALTIERI, DANIEL A., JR., Philadelphia, Pa. (Struct. Designing & Drafting, Catalytic Constr. Co.)
BAMMAN, HARRY W., Bradenton, Fla. (Super., Specialty Dept., Aquatite Tile Co.)
BANNING, ROBERT B., Miami, Fla. (Constr. Engr., City of Miami Engrg. Dept.)
BEHM, ROBERT S., Reading, Pa. (Field Engr., Master Builders Co.)
BENSON, EARLE G., Chicago, Ill. (Vice-Pres., A. J. Boynton & Co.)
BILANEY, M. M., Bombay, India (Cons. Engr.)
BOWEN, A. T., St. Jean, Canada (Genl. Super., Inspection, RCAF)
CASTAGNINI A., DOMINGO, Lima, Peru (Chf. Engr., Fabrica Peruana Eternit S. A.)
CLEMMER, CARL A., Akron, Ohio (Genl. Contr.)
COLMEY, V. W., Dunkirk, Ohio (Inspector, Toledo Testing Lab.)
CRICHTON, ROBERT M., Troutdale, Ore. (Matls. Engr., Physicist, Corps of Engrs.)
DAILY, JACK F., Kansas City, Mo. (Head of C. E. Dept., Lutz & May, Cons. Engrs.)
DOBROWOLSKI, JERZY ZENON, Ottawa, Canada (Asst. to Chf. Struct. Engr., Natl. Defence, Army QMG Dept. Work & Accommodation)
DRURY, JAMES K., Atlanta, Ga. (Struct. Engr., Wm. J. J. Chase, Arch.)
EDWARDS, P. G., Cleveland, Ohio (Control, Lab. Testing, The George Rackle & Sons Co.)
ELLIS, ROBERT HALL, Zebulon, N. C. (Super., Inspection, N. C. State Highway & Public Works Comm.)
ERICKSON, IRA H., Radford, Va. (C. E., Corps of Engrs.)
GARDNER, MAURICE H., Downey, Calif. (Contr.)
GRAY, PAUL THOMAS, La Habra, Calif. (Field Repr., Master Builders Co.)
GUCKEL, HERBERT B., Flushing, N. Y. (Struct. Engr., Consolidated Edison Co. of N. Y., Inc.)
HASSELL, CARL, Chicago, Ill. (Struct. Design, A. J. Boynton Co.)
HERMAN, DAVID, Beverly Hills, Calif. (Genl. Contr., Herco Constr. Co.)
HOFFMANN, WALTER, Detroit, Mich. (Struct. Engr., Albert Kahn Assoc. Archs. & Engrs.)
INGRAHAM, HARRY A., New York, N. Y. (R. C. Sr. Designer, Byrne Assocs.)
JOHNSON, GEORGE W., Clark Fork, Idaho (Concrete & Chem. Engrg. Pittsburgh Testing Lab., c/o Ebasco Services, Inc.,)
JORDY, G. L., Pittsburgh, Pa. (Mgr., Chimney Div.) The Rust Engrg. Co.,
JURETT, J. CALVIN, Miami, Fla. (Engr. of Tests, Wingerter Labs., Inc.)
LINDGREN, CHARLES J., San Francisco, Calif. (Owner, The Tricosal Co.)
LINDSAY, J. DOUGLAS, Springfield, Ill. (Engr. of Matls., Ill. Div. of Highways)
MARKELL, E. M., Los Angeles, Calif. (The Airox Co.)
MARTINELLI, JOSEPH, White Plains, N. Y. (Design, Drafting, Gibbs & Hill, Inc.,)
MCCALLUM, ANGUS, Kansas City, Mo. (Arch., Kivett & Myers)
MCGUIRE, ROBERT ALEXANDER, Oakland, Calif. (Engr.)
MENNIS, JAMES JOHN, San Antonio, Texas (Vice-Pres., Genl. Mgr., Prestressing, Inc.)
MILLER, GEORGE H., Chicago, Ill. (Dist. Engr., The Austin Co.)
NICHOLS, NORMAN D., Scarsdale, N. Y. (A. C. Horn Co.)
PADOUR, JOSEPH, Indianapolis, Ind. (Service Engr., Lehigh Portland Cement Co.)
PEREG, JACOB, Jerusalem, Israel (Struct. Engr., S. Diskin, Ltd., Engrg. & Contr.)
POKROVSKY, SERGE N., San Francisco, Calif. (Draftsman, Brown-Pacific-Maxon, Guam Contrs.)
PRATHER, JOHN W., JR., Spartanburg, S. C. (Struct. Design, Head of Constr. Dept., Lockwood Greene Engrs., Inc.)
ROSS, HARRY J., Miami, Fla., (Partner, Riley & Ross, Cons. Engr.)
RUSSELL, W. A., Springfield, Ill. (Mgr., Partner, Standard Concrete Pipe Co.)
SCHWINN, LAWRENCE L., Milwaukee, Wis. (Chf. Engr., Grassold & Johnson, Archs.)
SHAPIRO, BENJAMIN B., Chicago, Ill. (Cons. Engr.)
STAHL, ROBERT E., Philadelphia, Pa. (Struct. Designer, Catalytic Constr. Co.)
SWENSON, W. H., Billings, Mont. (Matls. Engr., USBR, Yellowstone Dist.)
TEGMAR, NILS, Malmo, Sweden (Cons. Engr.)
TYLER, EDGAR D., Cincinnati, Ohio (Partner, Potter, Tyler, Martin & Roth, Archs.)
VALACH, JAMES S., Champaign, Ill. (St., Univ. of Ill.)
VARANI, HAROLD V., Glenolden, Pa. (Struct. Engr., Catalytic Constr. Co.)
VON DOBENECK, KLAUS, New York, N. Y. (Chf. Engr., Wm. Neill Constructors, Inc.)
WESLECK, ERNEST S., Los Angeles, Calif. (Business Repr., Cement Masons Local No. 627; Instructor, Los Angeles Trade-Technical Jr. College)
WHITE, PORTER J., Lexington, Ky. (Cons. Engr.)
YOKOMICHI, HIDEO, Sapporo, Japan (Head, Hokkaido Kaihatsukyoku Doboku Shikenjo)
ZUCCARDY, FRANCIS ANTHONY, New London, Conn. (St., MIT)

Corporation

GATEWAY ENGINEERING CO., Chicago, Ill. (Frank D. Reiland, Pres.)
NAILABLE CINDER BLOCK CORP., Brooklyn, N. Y. (Henry C. Quaritius, Jr., Pres.)

Junior

AVCI, M. KAMIL, Casablanca, French Morocco (Design, Lab. Testing, Porter, Urquhart, Skidmore, Owings & Merrill)
BERMAN, HERBERT, Philadelphia, Pa. (Design, Drafting, Catalytic Constr. Co.)
FERNON, PRICE, Malvern, Pa. (Design, Catalytic Constr. Co.)
HUGHES, CLARENCE, Chicago, Ill. (Design, Lehigh Portland Cement Co.)
JONES, RALPH F., Bogong, Victoria, Austraila (Asst. Engr., State Electricity Comm. of Victoria)
KADLEC, JOSEPH C., Tujunga, Calif. (Concrete Foreman, John H. Goodman, Constr.)
KRETSCHMAN, PHILIP C., Philadelphia, Pa. (Drafting, Catalytic Constr. Co.)
MATCHETTE, GEORGE HAMPTON, JR., San Francisco, Calif. (Lab. Testing, Inspection, Board of State Harbor Comm.)
OLKO, STEPHEN M., Manhasset, N. Y. (Design, F. R. Harris, Inc., Cons. Engr.)
PASCUAL, MANUEL, JR., Roosevelt, P. R. (Genl. Engr., P. R. Railroad & Transport Co.)
PEREZ CID, LUIS, Palma, Soriano, Cuba (Cuba Public Works Dept.)
RITSEMA, DAVID, Gary, Ind. (Design, Detailing, The Austin Co.)
SCHOENING, ROBERT FRANKLIN, Kansas City, Mo. (Draftsman, Howard, Needles, Tammen & Bergendoff)
SILIMEO, JAMES J., Glen Olden, Pa. (Struct. Designer, Catalytic Constr. Co.)
SINGH, SARB JIT, Denver, Colo. (Struct., Hydraulic Design, Dr. J. L. Savage, Cons. Engr.)

Continued on p. 27

BETTER STRUCTURES

BEGIN WITH THE BALANCED STRENGTH OF LACLEDE MULTI-RIB REINFORCING BARS

Foundation of Central Catholic High School, East St. Louis, Illinois. Saunders and Johnson, Associated Architects Wm. H. & Nelson Cunliff Co.—Contractors

Designed to new A. S. T. M. specification A-305, Laclede Round Multi-Rib Reinforcing Bars actually provide increased anchorage . . . offer opportunities for appreciable savings in steel and concrete through the elimination of hooks and shortening of embedment lengths.

Specify Laclede Multi-Rib Reinforcing Bars by number . . . in standard sizes of the new A.S.T.M. specification A-305 Table I.

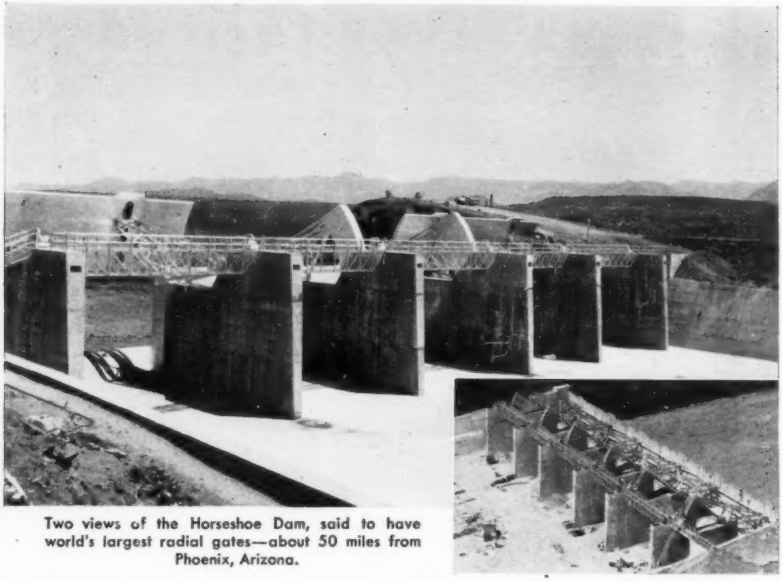
For the Best in Reinforcing Steel . . . Specify Laclede.

LACLEDE

Producers of Steel for Industry and Construction

LACLEDE STEEL COMPANY

St. Louis, Mo.



Two views of the Horseshoe Dam, said to have world's largest radial gates—about 50 miles from Phoenix, Arizona.

IN the construction of the Horseshoe Dam, builders faced the problem of obtaining satisfactory placeability, yet maintaining designed strength, in the comparatively thin sections of the piers which were heavy with steel reinforcement.

The builders' knowledge of the ability of Pozzolith — the cement dispersing agent — to improve plasticity even though water is reduced as much as 15%, assured them that it was the answer.

In addition to providing the most economical solution to the placing problem, Pozzolith produced good cohesiveness, thereby minimizing finishing costs.

Increased bond of concrete to steel and great durability were other benefits obtained with Pozzolith.

•

Close fitting pre-cast bascule weights which counterbalance the radial gates, also I-beam seal at bottom of gates, were precision grouted with another Master Builders' cement dispersion product—EMBECO—which produces non-shrink grout of high strength.

the MASTER BUILDERS Co
CLEVELAND 3, OHIO
Subsidiary of American-Marietta Company
TORONTO, ONTARIO

Honor Roll

February 1—April 30, 1952

Newlin D. Morgan, Sr., still leads the Honor Roll with 27 credits. A new addition to the Honor Roll, W. B. Summer, is in second place with 8 credits. F. Thomas Collins and Howard Simpson are tied for third place with 7 credits each.

The next Honor Roll will be published in the September JOURNAL since there are no issues for July or August. This list will include all credits received for members proposed in May and June. Will your name be included as one of ACI's Member-Getters?

Newlin D. Morgan, Sr. (Ill.)	27
W. B. Summer (Pa.)	8
F. Thomas Collins (Calif.)	7
Howard Simpson (Mass.)	7
Walter H. Price (Colo.)	6
Theodore O. Reyhner (Colo.)	5
Joseph A. Brunner (N. Y.)	4
George C. Ernst (Nebr.)	4
Arturo Obadia B. (Venezuela)	4
Hunter W. Hanly (Ohio)	3
G. B. Southworth (Ohio)	3
Miguel Angel Abalo (Cuba)	2
Pedro Arismendi A. (Venezuela)	2
Fred C. Bamman (Fla.)	2
Frederick L. Browne (Ore.)	2
J. R. Cassell (Md.)	2
Francisco J. Cordova (Ohio)	2
Raymond E. Davis (Calif.)	2
G. E. Elsenhans (N. Y.)	2
H. B. Emerson (Ill.)	2
L. G. Farrant (Fla.)	2
E. L. Howard (Calif.)	2
Lane Knight (Canada)	2
I. E. Morris (Ga.)	2
I. S. Rasmusson (Colo.)	2
Rafael Rodriguez (P. R.)	2
Mills Sampey (Ohio)	2
Saul Shaw (N. J.)	2
Chester P. Siess (Ill.)	2
Willard H. Stevenson (Ind.)	2
Ivan M. Viest (Ill.)	2
George E. Weingerter (Fla.)	2
Henry Wilckens (Australia)	2
Anis Yarid (French Morocco)	2
Robert Zaborowski (N. Y.)	2

New Members

Continued from p. 24

TROTT, CAMBRIDGE M., JR., Charleston, S. C. (Estimator, Charleston Constructors, Inc.)
VALENTI, CARL T., JR., Washington, D. C. (Matls. Engr., National Bureau of Standards)

Student

BARROETA, GONZALEZ, MARCIAL, Caracas, Venezuela
CAMPBELL, ALAN B., Cambridge, Mass. (MIT)
CAMPO, MARIO, Gainesville, Fla. (Univ. of Fla.)
CORDERO, RAFAEL C., W. Lafayette, Ind.
GYULVESZI, JOHN, Tillsonburg, Canada (MIT)
KIRSTEIN, ARTHUR F., Gainesville, Fla. (Univ. of Fla.)
KNUDSON, DONALD W., Champaign, Ill. (Univ. of Ill.)
LAWSON, JOHN F., JR., Denver, Colo. (Univ. of Denver)
LETZRING, WILLIAM JOHN, JR., Detroit, Mich. (Wayne Univ.)
MIHOVILOVICH, JOHN J., Denver, Colo. (Univ. of Denver)
SCHWAB, FRANCIS C., JR., Notre Dame, Ind. (Univ. of Notre Dame)
SOUTHWORTH, RICHARD N., Blacksburg, Va. (Va. Polytechnic Inst.)
VANKAMPEN, ALBERT J., Detroit, Mich. (Univ. of Mich.)
WEINTRAUB, SEYMOUR, Cambridge, Mass. (MIT)

Tools, Materials, Services

Under this heading note will be made from time to time of producer literature of presumed technical interest (and available from its source for the asking) to ACI users of tools, equipment, materials, accessories and special services.

Floor maintenance

A twelve-page practical guide for economical and efficient care of floors in office buildings, institutions, factories, schools and colleges covers the conditioning, repairing and maintenance methods for the widest variety of floor materials—concrete, asphalt tile, cork, linoleum, magnesite, terrazzo and wood. This brochure is available upon request.—A. C. Horn Co., Inc., 10th St. & 44th Ave., Long Island City 1, N. Y.

All-hydraulic scoopmobile

A new scoopmobile, Model H, comes equipped with ¾-yd scoop and is said to have a rated lift capacity of 4000 lb with a standard discharge height of 8 ft. It is claimed that hydraulic steering combined with planetary drive, provides the maneuverability and power to make the Model H a versatile front-end loader. It is also claimed that an efficient operator can handle up to 120 cu yd of bulk material per hour.—Mixermobile Manufacturers, 8027 N.E. Killingsworth St., Portland, Ore.

Vermiculate concrete floor specifications

This 12-page booklet presents concise data on the new vermiculite-sand concrete as a fill over structural floors, as a floor slab over supports on relatively close spacing, and as a slab laid on the ground. Also included in the booklet are specifications for vermiculite concrete floors on ground (with and without radiant heating units) that are topped with sand concrete.—Vermiculite Institute, 208 S. LaSalle St., Chicago 4, Ill.

Dynapakt concrete floors

A new illustrated 20-page bulletin entitled "Traffic Concrete—A Study in Specialization" describes the advantages of Dynapakt concrete floors in terms of materials used and especially developed methods of installation. The high-density, extremely hard Dynapakt topping is obtained by a process which depends upon proper material selection, proper formulation and power-driven installation equipment. The topping is claimed to be durable and long lasting because its extremely dense structure is uniform throughout the entire depth. A step by step comparison of Dynapakt low-water ratio methods as opposed to wet mixes is included. Bulletin available upon request.—Flash-Stone Co., 3723 Pulaski Ave., Philadelphia 40, Pa.

Skid-shovel

A skid-shovel has been designed to eliminate hoses or pipes cluttered around the operator and all hydraulics are fully enclosed and protected. The rear end is free from mounting auxiliary equipment and low overall clearance permits work in confined areas. A patented feature called "break-out action" is said to give the bucket a crowding action at every bite, assuring a heaped load from any cut. The bucket is rolled back as much as 28 in. before the load is lifted, and the extra yardage does not slip off the heap. The force of this prying action is said to be transmitted through the loader shoes into the ground—not into the tractor. It is claimed that by lever arrangement, action of the bucket control cylinders is reversed to provide greater power for digging and speed for dumping. A depth gage indicator on the bucket control ram enables the operator to adjust his depth of cut to within a fraction of an inch.—Drott Mfg. Corp., Milwaukee 12, Wis.

Steel shore

A self-contained, telescoping steel shore that is handled by one man and permits micro-adjustment is claimed to be effective in supporting forms for concrete slabs, beams, columns, walls, tunnels and other shoring work, permitting a 5 ft range of adjustment. Three sizes cover a range all the way from 6 to 15½ ft above the mounting surface. The three sizes of shores have height ranges for 6-11½ ft, 8-13 ft and 10½-15½ ft, respectively.

Heavier load-carrying capacities to as high as 9900 lb, with adequate safety factor, are said to be possible by the special sleeve nut design. As a result, spacing of shores is claimed to be greater, reducing the number of shores needed and proportionately reducing erection and dismantling costs. Further information is available upon request.—Safway Steel Products, Inc., 6234 W. State St., Milwaukee 13, Wis.

Cement floor covering

A combination of magnesium chloride and magnesium oxide with certain fillers and fine aggregates is claimed to produce a cement that sets within a few hours forming a hard, dense, durable mass with excellent characteristics as a flooring material. This cement is marketed under the trade name of Magna-Crete and supplied in dry form to be mixed on the job to a mortar consistency, then spread, leveled and finished by troweling. Among the advantages claimed for Magna-Crete are its comparatively light weight, good bonding qualities, resistance to oils and greases, granite-hard surface, silence, moderate price range, high structural strength, long life and low maintenance cost. Descriptive bulletin is available upon request.—Flash-Stone Co., Inc., 3723 Pulaski Ave., Philadelphia 40, Pa.

Bulletin on cement testing equipment

This six-page bulletin illustrates and describes various types of precision-built equipment designed to provide accurate determinations needed in maintaining accepted standards of quality in concrete, asphalt and bituminous materials.

Included are descriptions of such items as the Cenco-Menzel autoclave for testing cement soundness, entrained air indicator, ductility tester for bituminous material, viscosimeter, penetrometer, etc. Copies of Circular 1212 are available upon request.—Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill.

Concrete mixer

A 3½ cu ft end discharge mixer with a high-quality, semi-steel, cast drum and yoke has just been introduced. The manufacturer states that development of a rugged but simplified end discharge mounting requires less time and steel to fabricate.

The new mixer features a ring gear integrally cast with the load-balanced drum for better alignment and smoother operation. Drum drive shaft and yoke are both mounted on Timken roller bearings. Charging and discharging is made easier by a geared tilting mechanism and friction brake lever which locks the drum at any desired position in its complete swing. Power and drive are provided by an air cooled gas engine and roller chain on machine-cut, steel sprockets. Additional information is available upon request.—Gilson Brothers Co., 29 W. Gilson Ave., Fredonia, Wis.

Surface pyrometer

A new surface pyrometer for accurate surface and sub-surface temperature measurements is claimed to incorporate features not found in any other instrument of this type. The instrument is available with a selection of 14 different types of thermocouples and extension arms. The manufacturer claims that it can be equipped with a new quick-change connector which permits the thermocouples to be snapped and locked onto the extension arms in a matter of a second without any tightening needed. The pyrometer is available in five different temperature ranges for laboratory and plant use.—Pyrometer Instrument Co., Inc., Bergenfield, N. J.

Plaster and mortar mixer

A new plaster and mortar mixer, 6 cu ft capacity, known as "Model 80" has been announced. Among the improved new features of this machine is the "shaft seal" which replaces the conventional stuffing boxes and packing. According to the manufacturer, this new seal not only reduces friction loss but it also alleviates wear on the paddle shaft. Information is available upon request.—Muller Machinery Co., Inc., Metuchen, N. J.

Hykap loader

Designed to provide greater productivity, the Hykap loader is said to be extremely successful as a time and man saver. The loader, which is adjustable to any size dump truck, consists of an attachable shovel or magnet, arms, and hydraulic equipment. According to the manufacturer, the Hykap loader transforms a standard dump truck into an all-purpose unit that can do the work of several machines. The loader is mounted on the rear of the truck body and is operated by controls on the top of the truck cab or from auxiliary controls on the side of the truck.—Efficient Equipment, Inc., 1621 W. Hastings St., Chicago 8, Ill.

Concrete water repellent

A new type of water repellent applicable to concrete, stucco, brick and many other materials has recently been developed. It is designed to supply the missing water repellency of mineral silicates in masonry and is said to be easily applied over the surface in a colorless liquid state. Descriptive literature is available upon request.—Williams Form Engineering Corp., 1501 Madison Ave., S.E., Grand Rapids 7, Mich.

SYNOPSES of ACI Papers and Reports in JOURNAL Vol. 23

Separate prints are currently available at prices indicated. Please order by title and title number. Quantity prices on request.

EARTHQUAKE RESISTANT DESIGN CONSIDERATIONS.....48-1

Price 35 cents.

R. R. MARTEL—Sept. 1951, pp. 1-4 (V. 48)

Basic behavior characteristics of earthquakes, their effects on structures and considerations for further study of design criteria.

COMPREHENSIVE NUMERICAL METHOD FOR THE ANALYSIS OF EARTHQUAKE RESISTANT STRUCTURES.....48-2

Price 50 cents.

CHARLES S. WHITNEY, BOYD G. ANDERSON and MARIO G. SALVADORI—Sept. 1951, pp. 5-28 (V. 48)

A new step-by-step method for the analysis of earthquake stresses in multistory frame buildings is presented and compared with the rigorous solution of the same problem to evaluate its efficiency. The following essential factors influencing earthquake stresses are considered: (1) stiffness and internal damping of the resisting structure, (2) rocking of the foundation due to the yield of the ground, and (3) period and amplitude of the earthquake components. It is shown how the method can be extended to buildings in which stresses beyond the elastic limit create plastic hinges. Estimates of time and labor required by the proposed method are presented.

MULTISTORY BUILDINGS DESIGNED TO RESIST EARTHQUAKES.....48-3

Price 35 cents.

JOHN J. GOULD—Sept. 1951, pp. 29-36 (V. 48)

Earthquake resistant provisions of the San Francisco building code were met by the exclusive use of reinforced concrete in the construction of eleven 13-story apartment buildings. The X-shaped apartments have flat-slab floors with wide flat beams over corridors. Exterior walls are of the bearing-wall type without columns. Many interior partitions are of reinforced concrete to resist vertical as well as horizontal loads. An advantage of the interior bearing wall system is that lateral bracing for earthquake resistance is increased at little extra cost.

It was estimated that the extra cost of earthquake resistance was only 1 to 2 percent of the total, as compared with otherwise sound minimum construction, due to the structural system chosen.

LIGHTWEIGHT CONCRETE FOR LOWER CONSTRUCTION COSTS.....48-4

Price 35 cents.

J. A. MURLIN—Sept. 1951, pp. 37-44 (V. 48)

From accurate construction costs taken from the contractor's records on a cost plus fixed fee contract, it is demonstrated that the use of lightweight expanded shale concrete plus flat-plate design substantially reduced the cost of the structural frame of a two-story office building. Comparative figures are given for eight different types of construction in normal or lightweight concrete. The method of analysis used in designing the lightweight flat plate is discussed.

The mix design for the lightweight concrete is given and the plant set-up for the use of mixers in series is described. Results of laboratory tests of control cylinders are shown.

DESIGNING FOR CONTINUITY IN PRESTRESSED CONCRETE STRUCTURES48-5

Price 50 cents.

ALFRED L. PARME and GEORGE H. PARIS—Sept. 1951, pp. 45-64 (V. 48)

The design of simply supported prestressed members has been well established but the design of continuous prestressed concrete structures has received little attention because of difficulty in analyzing such members. A method of analysis is developed for continuous prestressed members that reduces the problem to the same simplicity of analysis by moment distribution as for ordinary continuous reinforced concrete members.

The method is relatively simple and does not involve abstract integrations of complicated expressions. The problem of design is simplified to the extent that a physical relationship can be seen between the profile of the curved wires and the forces they exert on the structure. Because the stresses produced by these forces can be readily determined, the method of analysis offers greater flexibility in the design of continuous prestressed structures.

PUMICE—LIGHTWEIGHT AGGREGATE.....48-6

Price 50 cents.

LESLIE I. NEHER—Sept. 1951, pp. 65-76 (V. 48)

The growth of pumice production in the United States during recent years is worthy of note. Chemical and physical properties, mix design, presaturation of aggregates and the application of pumice aggregates in lightweight tilt-up and masonry construction are discussed.

HYDRATION PRODUCTS FORMED IN CEMENT PASTES AT 25 TO 175 C..48-7

Price 50 cents.

GEORGE L. KALOUSEK and MILTON ADAMS—Sept. 1951, pp. 77-92 (V. 48)

Research described indicates the chemical nature of a new potential hydration product of cements responsible for the high strength of steam cured cement products. Differential thermal analysis was used in studying hydration products of cement and related solids at temperatures between 25 and 175 C. Additions to the cement included gypsum and finely ground quartz. The trisulfate form of calcium sulfoaluminate and presumably the analogous sulfoferrate were found as the initial R_2O_3-bearing hydrates at temperatures between 25 and 100 C, but these transformed to the related solid solution of the SO_3-bearing solids. The latter then converted to phase X. At 100 C these consecutive reactions appeared to be complete in 3 to 4 hours, and increasingly longer time was required for completion as the temperature was lowered. The solid solution formed in greater abundance at about 70 to 100 C than at lower temperatures.

The hydrogarnets were not found in any sample of cement hydrated at temperatures between 25 and 175 C. Samples of pure $4CaO \cdot Al_2O_3 \cdot Fe_2O_3$ converted initially to hydrogarnets in the presence of water, but with periodic regrinding of the solids it was found that in the interval between about 3 and 6 months the initial product was transformed completely into $4CaO \cdot Al_2O_3 \cdot 13H_2O$, which probably contained some integrally bound Fe_2O_3, and a gel.

Experimentation on the synthesis of phase X indicated that this solid may be a gel consisting of all the oxide constituents of cement. Lime, silica and ferric oxide are required constituents for the formation of this phase. Ground silica added to the cement in an amount of about 8 to 10 percent appeared to combine with all the hydrolytic $Ca(OH)_2$ at 175 C, the reaction product being the crystalline dicalcium silicate hydrate discovered by Thorvaldson and Shelton. The total amount of this phase was estimated to be about one-third to one-half of the reaction products. Further additions of silica reacted in turn with this compound and at about 40 to 45 percent addition the new product of reaction approached in composition a $CaO:SiO_2$ molar ratio of about 1.0 and is characterized in thermal analysis by a pronounced exothermic peak at 840 ± 5 C.

ADVANCES IN PRECAST FLOOR SYSTEMS.....48-8

Price 50 cents.

F. N. MENEFEE—Oct. 1951, pp. 113-124 (V. 48)

Reinforced concrete floors and roofs for office and school buildings, apartments, and similarly loaded structures are being made of precast blocks assembled to form a "plank" or "slab," precast joists with a precast filler placed between, and 4-it wide precast slabs supported by two integrally precast T-joists.

The high cost of carpentry has brought about a successful attempt to eliminate most of the previously required formwork. The trend is toward units made of high strength, lightweight aggregate under closely controlled factory conditions.

In one of the plank or slab types herein reported the steel is given a stress of approximately 18,000 psi, but it is believed that most of this prestress is lost through shrinkage and plastic flow by the time actual working loads are imposed.

Special shape block forming and grinding equipment produces blocks to be assembled into floor plank or slabs held in compressed relationship by threaded steel reinforcing rods. Precast inverted T-joist forming machinery makes joists to be used with a special shaped hollow filler block to make a floor which may be laid without form work.

Tests show that for the most part standard reinforced concrete theory is applicable to these new floor systems. Where there is doubt as to the theory covering the new types, tests are being made under Sec. 103 (a) ACI Building Code (318-51) and Minimum Standard Requirements for Precast Floor Units ACI 711-46, resulting in widespread approval

MANUFACTURE AND USE OF MACHINE-MADE PRECAST STRUCTURAL ELEMENTS.....48-9

Price 35 cents.

A. G. STREBLOW—Oct. 1951, pp. 125-132 (V. 48)

Experience with precast piles, joists and cored roof and floor sections and the introduction of automatic block making machines suggested the development of new precast products. The characteristics and application of floor and roof slabs, wall sections, prefabricated packaged buildings, columns, beams, planks and special structures are described.

TILT-UP CONSTRUCTION IN WESTERN UNITED STATES.....48-10

Price 50 cents.

F. THOMAS COLLINS—Oct. 1951, pp. 133-144 (V. 48)

Precast concrete construction is increasing rapidly in the United States. The method described is that commonly known as "tilt-up" or flat cast construction which has proved most economical and most readily adopted by the general contractor in Southwestern and Western United States. This method makes possible savings in material and skilled labor which are becoming more critical under present conditions.

Data and recommended procedures are given for casting platforms, forming methods, bond breaking agents, wall panel design and construction, and erection of precast members. The patent situation affecting precast construction is discussed briefly.

DIAGONAL TENSION IN REINFORCED CONCRETE BEAMS...48-11

Price 50 cents.

ARTHUR P. CLARK—Oct. 1951, pp. 145-156 (V. 48)

Resistance of reinforced concrete beams to diagonal tension was investigated in a series of tests which included beams with no web reinforcement and beams with varying ratios of web reinforcement consisting of ⅝-in. round deformed bars. Strains in the web and tensile reinforcement were measured with resistance strain gages; deflections of the beams under load were also measured and the number and extent of cracks were observed.

Beams of two cross sections, four span lengths and concrete strengths ranging from 2000 to 6000 psi were tested for five different positions of concentrated loads. One of the results of these tests, not previously demonstrated, is that the position of the loads on a beam influences considerably its shear carrying capacity. An empirical formula based on the data obtained in this study indicates that the shear resistance of the beams varies as the square root of the percentage of web reinforcement and linearly as the compressive strength of the concrete multiplied by a factor representing the ratio of effective depth of beam to distance from plane of the nearest concentrated load point to plane of the support.

CORAL AND SALT WATER AS CONCRETE MATERIALS.....48-12

Price 50 cents.

JOHN G. DEMPSEY—Oct. 1951, pp. 157-168 (V. 48)

Concrete in which coral and its related soft and porous limestones are used as aggregate presents more than the usual number of problems in controlling uniformity and quality. Using sea water for mixing has always been a reluctant last resort. This paper describes coral materials, the problems arising from their use, and the methods of mix control used to obtain uniformly satisfactory concrete. Notes on the action of sea water are presented with an account of field experience with it.

LOAD CARRYING CAPACITY OF DOWELS AT TRANSVERSE PAVEMENT JOINTS.....48-13

Price 50 cents.

HENRI MARCUS—Oct. 1951, pp. 169-184 (V. 48)

The load carrying capacity of dowels at transverse joints of concrete pavements is dependent upon width of joint, size and length of dowel, slab thickness, strength of concrete and steel, dowel alignment and compressibility of the subgrade supporting soil.

To evaluate the efficiency of the dowels, three test groups investigated the effect of various factors: (1) resistance of concrete to bearing stresses distributed uniformly by dowels of different diameters; (2) effect of dimensions and spacing of dowels, dimensions and strength of concrete and compressibility of subbase; and (3) sliding resistance of dowels coated with various substances.

TILT-UP CONSTRUCTION COSTS....48-14

Price 35 cents.

F. THOMAS COLLINS and EARL M. BENNETSEN—Nov. 1951, pp. 197-204 (V. 48)

Cost data for tilt-up construction are broken down into six components—casting platform, forming, pouring and curing panels, erection and construction of columns—and compared with a general over-all cost for reinforced brick masonry construction. As with all cost comparisons necessary allowances must be made for local conditions and prices and for changes in the general economic structure. A short form is presented as an aid in estimating costs.

EFFECT OF TEMPERATURE AND SURFACE AREA OF THE CEMENT ON AIR ENTRAINMENT.....48-15

Price 35 cents.

E. W. SCRIPTURE, JR., S. W. BENEDICT and F. J. LITWINOWICZ—Nov. 1951, pp. 205-212 (V. 48)

A number of factors influencing air entrainment have been previously reported. Two further factors affecting the amount of air entrained in concrete mixtures, temperature and the surface area of the cement have been investigated. The amount of air entrained decreases with increasing temperature, expressed as its volume at standard temperature and pressure. With increasing surface area of the cement the amount of air entrained by air-entraining agents decreases but there is no significant variation when no air-entraining agent is used.

FOUNDATION FOR A LARGE TURBOGENERATOR.....48-16

Price 50 cents.

PAUL ROGERS—Nov. 1951, pp. 213-224 (V. 48)

A practical method is presented for the structural design of large turbogenerator supports of reinforced concrete. The loads and forces acting on the support are enumerated, their origin is explained and their values are appraised. Computations for one cross bent are presented in detail and the advantages of embedded steel girders to resist horizontal forces, is emphasized.
The method is applicable to the design of foundations for units of 20,000 KW or larger. The general layout and loading arrangement of all makes are similar, only the values of loading and dimensions differ.

MEASUREMENT OF THE DISTRIBUTION OF TENSILE AND BOND STRESSES ALONG REINFORCING BARS.....48-17

Price 50 cents.

R. M. MAINS—Nov. 1951, pp. 225-252 (V. 48)

Tensile and bond stresses were measured along reinforcing bars by a new technique which does not disturb bond stresses. Curves for representative beam and pull-out specimens show tensile force distribution, bond stress distribution, applied moment versus measured bar tension, comparison of beam and pull-out tensile force distribution, and applied load versus slip of the bar. Building code requirements imply that bond stress in a beam is a direct function of shear, and that longitudinal distribution of bond stress in a pull-out specimen is uniform. These tests show that these are oversimplifications of the problem, which has been understood (but without experimental proof) for some years. Comparison of ordinarily calculated bond with measured local maximum values shows the calculated values to be frequently less than one-half the values measured in these tests. The effect of standard hooks on the behavior of plain and deformed bars is shown for the particular specimens used. Evidence is presented that cracks in beams decisively affect the magnitude and distribution of tensile and bond stresses—probably one of the more significant results of these tests. Tensile forces in reinforcing bars in beams as ordinarily calculated and as measured in these tests are compared. Calculated values are usually lower than measured values for loads near the ultimate when shear as well as moment acts on the beam.

INSULATION FOR PROTECTION OF NEW CONCRETE IN WINTER...48-18

Price 50 cents.

L. H. TUTHILL, R. E. GLOVER, C. H. SPENCER and W. B. BIERCE—Nov. 1951, pp. 253-272 (V. 48)

Recent investigations show that new concrete with 1 percent calcium chloride, if kept from dropping below 50 F for 3 days, has sufficient protection from freezing. As an extra precaution, 3 more days protection from dropping below 32 F may be required. Since it is during the first 3 days that considerable heat is generated by the setting cement, it has been learned that insulation, within practical limits, is capable of retaining enough of this heat to keep new concrete from dropping below these temperatures. This avoids construction of special enclosures, fuel costs, and danger of fire. Examples of field applications and tests of insulation are reported together with resultant concrete temperatures. Also, there are described some aids which have been developed for determining what insulation is necessary under various conditions.

LATERAL FORCE DISTRIBUTION IN A CONCRETE BUILDING STORY.48-19

Price 50 cents.

T. Y. LIN—Dec. 1951, pp. 281-296 (V. 48)

A rational method for the distribution of lateral forces among vertical resisting elements of a concrete building story is presented. The basic theory is given together with examples, including the general case of walls and odd-shaped columns at skew angles to one another.

AIR ENTRAINMENT AND RESISTANCE TO FREEZING AND THAWING.....48-20

Price 50 cents.

E. W. SCRIPTURE, JR., S. W. BENEDICT and F. J. LITWINOWICZ—Dec. 1951, pp. 297-308 (V. 48)

Investigations were undertaken to determine the suitability of various air-entraining agents for use in concrete, the relative effects of slow and rapid cycles of freezing and thawing, and the optimum range of air contents for concrete. With normal air-entraining agents the resistance to freezing and thawing varies mainly with the air content, not with the particular agent used. A rapid freezing and thawing cycle is considerably more destructive than a slow cycle, and abnormal results appear to be produced in some cases by a very fast cycle. With increasing entrained air resistance to freezing and thawing increases to a maximum and thereafter no further benefit appears to be secured. The optimum amount seems to be about 2½ to 3 percent *added* entrained air.

STREAMLINED VACUUM CONCRETE BUNTONS FOR MINE SHAFTS.....48-21

Price 50 cents.

PETER J. DOANIDES—Dec. 1951, pp. 309-320 (V. 48)

Vacuum processed reinforced concrete beams have proved superior to steel and timber for structural bracing elements (buntons) in mine shafts in the gold fields of the Orange Free State, South Africa. Concrete buntons fulfill strength and impact resistance requirements with the additional advantage that they can be streamlined to offer less resistance to flow of air for ventilation and better resist corrosion.
Impact, bending and deflection tests are described. These tests of prototype buntons indicated certain weaknesses which were taken into account in redesigning the buntons.

SIMPLE CONCRETE SHELL STRUCTURES.....48-22

Price 50 cents.

FELIX CANDELA—Dec. 1951, pp. 321-332 (V. 48)

Some small simply-designed reinforced concrete shells constructed in Mexico City are described. Included are three types of cylindrical shells and two skewed shell structures. They were erected by relatively unskilled labor at a competitively low cost and provided novel solutions to owner's requirements.

CONCRETE FOOTINGS FOR WALLS AND COLUMNS.....48-23

Price 50 cents.

PAUL JAKOWLEW-HERBACZEWSKI—Dec. 1951, pp. 333-352 (V. 48)

Equations are developed from which charts and tables are prepared which permit the determination of optimum dimensions for concrete footings. The effect of varying costs of materials is considered and a method is given for determining the economical percentage of steel in concrete.

BUILDING MULTISTORY REINFORCED CONCRETE TANKS...48-24

Price 35 cents.

E. J. CRITZAS—Jan. 1952, pp. 365-372 (V. 48)

A brief description of some of the field problems encountered in building rectangular multistory reinforced concrete tanks used for the storage or fermentation of beer. Tank drainage and plant ventilation required special formwork to provide the necessary warped or sloped surfaces. Specified coverage and placement of reinforcement led to development and use of special precast concrete spacer blocks and metal chairs. Varying job conditions dictated use of both metal and plywood forms and rough surfaces required for bonding corrosion-resistant lining imposed special concrete finishing techniques.

CONSERVATION OF STEEL BY DESIGN.....48-25

Price 35 cents.

O. W. IRWIN—Jan. 1952, pp. 373-380 (V. 48)

Conservation of steel is a live issue. This paper is limited to suggestions for saving steel in reinforced concrete design; it does not deal with the broader conservation possible through substituting reinforced concrete for structural steel.

AUTOMATIC JACKS SPEED SLIDING-FORM CONSTRUCTION...48-26

Price 50 cents.

DAVID F. STOUT and ROBERT E. WILDE—Jan. 1952, pp. 381-392 (V. 48)

Electric jacks which leveled automatically, and threaded steel plugs for joining jack rods, offered advantages in sliding-form construction of a grain elevator. Notable were speedier construction, simpler erection procedure and minimum labor crews.

Essential factors in sliding-form construction are reviewed and construction procedures described.

CORRELATION OF SHRINKAGE AND CURING IN CONCRETE MASONRY UNITS.....48-27

Price 50 cents.

HARRY W. EASTERLY, JR.—Jan. 1952, pp. 393-404 (V. 48)

Need for a specification defining maximum shrinkage in concrete masonry units has long been recognized. The present specification which limits the amount of moisture in the unit when it is laid is inadequate and cannot be enforced. This paper shows how use of the British specification which limits shrinkage rather than moisture content in the block was applied to block cured by high-pressure steam and by high-temperature steam. High-pressure steam cured blocks shrank only about half as much as those cured by high-temperature steam. The literature on high-pressure steam curing is briefly reviewed and the British standard method of measuring drying shrinkage is shown to be applicable to masonry units manufactured in this country.

EQUIVALENT LOAD METHOD FOR ANALYZING PRESTRESSED CONCRETE STRUCTURES.....48-28

Price 50 cents.

ROBERT B. B. MOORMAN—Jan. 1952, pp. 405-416 (V. 48)

A method is presented for post-tensioned reinforced concrete structures whereby the effect of cable tension can be expressed as a distributed or concentrated load. The analysis thus becomes a simple matter of applying methods with which the designer is already familiar. The function of the post-tensioned wires thus can be visualized easily.

WHY SMALL JOBS FREQUENTLY GET POOR CONCRETE.....48-29

Price 35 cents.

A. W. BRUST—Jan. 52, pp. 417-424 (V. 48)

A survey of materials, methods of proportioning, mixing and placing ready-mixed concrete for housing and small industrial projects. Lack of systematic material and mix control and general absence of field inspection and testing result in great variations in concrete of supposedly uniform quality.

ANALYSIS OF SKEWED RIGID FRAMES AND ARCHES.....48-30

Price 50 cents.

JAMES P. MICHALOS—Feb. 1952, pp. 437-456 (V. 48)

A numerical procedure for the analysis of single-span skewed rigid frames and arches, subjected to loads or deformations in any direction, is presented. The structure may have any shape and any variation in cross section along its length. Several examples are included.

USE OF CHICAGO FLY ASH IN REDUCING CEMENT-AGGREGATE REACTION.....48-31

Price 35 cents.

C. H. SCHOLER and G. M. SMITH—Feb. 1952, pp. 457-464 (V. 48)

The use of 20 to 30 percent Chicago fly ash, by total weight of fly ash plus cement, effectively and economically inhibits certain types of cement-aggregate reaction in concrete. Fly ash, a finely divided dry powder collected by precipitators from flue gases of pulverized coal-burning power plants, forms a cementing medium when it combines with the lime liberated during the hydration of a portland cement. The data presented in this paper refer only to a fly ash obtained from the Chicago area; fly ash from other localities may not necessarily produce the same results since they are known to vary considerably in chemical and physical properties.

Laboratory tests consisted of subjecting 3 x 4 x 16-in. beams to two different accelerated exposures to determine cement-aggregate compatibility. These two accelerated exposures have shown an excellent correlation with observed field service records. Cement-aggregate reaction as referred to in this paper is not restricted to the alkali-aggregate reaction, but refers to the physical and perhaps chemical reactions or a combination of both which causes the expansion that is accompanied by "map cracking."

Use of fly ash produces concretes similar in nature to concretes with ordinary portland cement, with fly ash concretes showing an increase in workability and improved finishing characteristics.

DIRECT DESIGN OF RECTANGULAR COLUMNS WITH BENDING ABOUT AN AXIS OF SYMMETRY..48-32

Price 50 cents.

HENRY J. COWAN—Feb. 1952, pp. 465-484 (V. 48)

A new method for the design of eccentrically loaded reinforced concrete columns based on the principle of superposition. The section is designed to resist the bending moment due to the eccentricity of the column load, using the well-known equations for rectangular reinforced concrete beams; the area of reinforcement is then reduced to allow for the direct compression due to the column load.

In the standard method the dimensions of the section are assumed and the depth of the neutral axis and the maximum stresses in the steel and the concrete are then calculated. In the present method the neutral axis depth ratio is assumed, and the dimensions of the section are calculated from the maximum permissible stresses of the materials; this is therefore a direct design procedure.

Rules are given for determining the depths of the neutral axis so as to produce a section with (a) a specified percentage of tension reinforcement only; (b) a specified percentage of symmetrical reinforcement; (c) the lowest possible area of (unsymmetrical) reinforcement within the limits set by the dimensions of the cross section; and (d) the lowest possible area of reinforcement when the dimensions of the cross section are not limited.

THERMAL EXPANSION OF AGGREGATES AND CONCRETE DURABILITY.....48-33

Price 50 cents.

EDWIN J. CALLAN—Feb. 1952, pp. 485-504 (V. 48)

Differences in durability of concretes containing aggregates from the same source and similar concretes containing different fine and coarse aggregates are explained partially by differences in thermal expansion of the coarse aggregate and the mortar. Methods were developed to obtain simply the thermal coefficients for numerous aggregates. Concretes were tested in accelerated freezing and thawing, yielding durability factors, DFE, for each combination. The DFEs were statistically analyzed with the difference between the thermal coefficients of coarse aggregates and mortars, Δc, and coarse aggregate absorption, A, as variables. For 78 concrete combinations a relation $DFE = 109.65 - 8.76\ \Delta c - 15.22\ A$ was developed with a correlation coefficient of 0.719, which is highly significant. Thus,

the durability of these concretes was reduced when the differential expansion of mortar and coarse aggregate increased. Stresses set up by such differential expansion and their effects on concrete durability are discussed briefly. It is concluded that thermal effects of this type should be considered in choosing aggregates for highly durable concretes. The methods developed for determining coefficients of thermal expansion of coarse aggregate and mortar are described.

RELATIVE ECONOMY OF PRESTRESSED AND CONVENTIONAL REINFORCED CONCRETE RESERVOIRS.....48-34

Price 35 cents.

G. C. ERNST, C. O. BRUNKEN and A. R. RIVELAND—Feb. 1952, pp. 505-512 (V. 48)

Cylindrical walls designed for various stress combinations for conventional and prestressed conditions are compared, and the most advantageous are selected for an economy study. Quantities of concrete and steel from 180 complete reservoirs and 80 additional wall designs reveal that those of prestressed concrete have a lower first cost than conventional designs, if the unit cost of the prestressed wall in place does not exceed approximately twice that for the conventional wall. The investigation also showed that in most cases of unrestricted site location with the same controlling water elevation, reservoirs above ground were more economical than underground reservoirs, insofar as first cost is concerned. However, underground reservoirs could compete with those above ground for capacities greater than 2.5 million gallons. As to materials, prestressed construction saved from 40 to 60 percent of steel and from 0 to 35 percent of concrete.

NEW TECHNIQUES IN THE STUDY OF SETTING AND HARDENING OF HYDRAULIC MATERIALS.....48-35

Price 50 cents.

J. CALLEJA—Mar. 1952, pp. 525-536 (V. 48)

This paper attempts to establish basic ideas for research on the setting and hardening of hydraulic materials through use of methods based on the variation of the electrical resistance of a paste during its setting period. This method is superior to classical ones, due to its wider application and provision for more detailed data on the pheonomenon. Moreover, it can be applied automatically.

Theoretical considerations as well as experimental evidence show that the beginning and end of the setting period are indicated on resistance-time graphs by well defined points closely linked to points of graphs showing temperature changes during setting.

CALCIUM CHLORIDE IN CONCRETE.....48-36

Price 50 cents.

J. J. SHIDELER—Mar. 1952, pp. 537-560 (V. 48)

Calcium chloride has been used for many years to accelerate the early strength development of concrete. Its effect on other properties of concrete are not as well known. This paper presents test results on the effects of type of cement, age, temperature and mix proportions on the strength of concrete containing $CaCl_2$ as well as the effect of $CaCl_2$ on the volume change, heat generation, time of set, alkali-aggregate reaction, resistance to abrasion and sulfate attack of concrete. References to the work of other investigators and some of their general conclusions are included.

REINFORCING STEEL IN CONCRETE AND THE CONCEPT OF SAFETY.....48-37

Price 50 cents.

K. HAJNAL-KONYI—Mar. 1952, pp. 561-580 (V. 48)

Comparative tests on 36 beams reinforced with various types of large size bars, both in ordinary and high grade concrete, prove the superiority of cold worked steel over steel having a natural yield point as regards safety factor and warning before failure. They also prove the advantage of deformed bars over plain bars regarding bond, crack formation and the necessity of increasing the strength of reinforcement, with improved bond, to avoid failure without warning.

Two beams reinforced with 0.104-in. plain wires with a 268,800 psi tensile strength were also tested. Failure occurred by fracture of the reinforcement although the wires were not prestressed. Cracks were much narrower than with large size bars at comparable stresses.

Strain measurements, within a very wide range of steel stresses and failure (42,500 to 294,200 psi), demonstrate good agreement with Whitney's method of determining the position of the neutral axis.

APPLICATIONS OF VACUUM CONCRETE.....48-38

Price 50 cents.

K. P. BILLNER—Mar. 1952, pp. 581-592 (V. 48)

Vacuum concrete processes were introduced in this country a number of years ago and their applications in building construction have been reported in the ACI Journal. During the last few years these processes have become known and adopted in many foreign countries, particularly in Europe, and this paper deals with these foreign developments, singling out new ways and methods in construction.

EXCITING ADVENTURES.....48-39

Price 35 cents.

HARRY F. THOMSON—Apr. 1952, pp. 609-612 (V. 48)

Retiring ACI President Thomson reviews the year's activities of the Institute. He considers membership growth, financial condition, staff activities, committee work, special publications, intersociety relations and Institute meetings. He looks forward to increasing development of new techniques in concrete and new applications of this versatile material.

WAVE VELOCITY IN CONCRETE..48-40

Price 50 cents.

JOHANNES ANDERSEN and POUL NERENST—Apr. 1952, pp. 613-636 (V. 48)

Nondestructive testing of concrete has aroused increasing interest throughout the world as it presents a new approach to determination of concrete quality. A Danish timing device and its application to determination of the wave velocity in concrete specimens is described. The progress of hardening of concrete specimens was followed, and a hypothesis for the relation between wave velocity and age is presented. The method has been used on concrete *in situ* including measurements of concrete members damaged by exposure to fire or freezing at an early age. Measurements on concrete pavements give wave velocities with small variation. An appendix presents detailed procedure for calculating wave velocity and an estimate of concrete homogeneity.

SLIP-FORMS FOR CONCRETE CANAL LINING.....48-41

Price 35 cents.

T. V. D. WOODFORD—Apr. 1952, pp. 637-644 (V. 48)

Two types of slip-forms for placing concrete lining in irrigation canals are described. One type, which rides directly on the previously prepared subgrade, is a recent development for use primarily in small canals and farm ditches. Both types of equipment are now in wide use and have effectively reduced the cost of lining operations, fulfilling an urgent need for the conservation of water in the western states.

SHORT CUTS IN THE DESIGN OF CONTINUOUS STRUCTURES.....48-42

Price 35 cents.

I. E. MORRIS—Apr. 1952, pp. 645-652 (V. 48)

In preliminary design to determine concrete member sizes or cost comparisons, time-saving methods involving a reasonable degree of accuracy are desirable. Moment coefficients for both positive and negative moments are limited to spans which are approximately equal. In the proposed method, coefficients are used for negative moments only. With known negative moments, positive moments are easily determined by the application of simple statics. Whether the method has the requisite accuracy for a final design depends largely upon the implicitness of the designer's faith in elastic stress analysis.

ILLINOIS EXPERIMENTAL CONTINUOUSLY REINFORCED CONCRETE PAVEMENT AFTER FOUR YEARS.....48-43

Price 35 cents.

J. D. LINDSAY and H. W. RUSSELL—Apr. 1952, pp. 653-660 (V. 48)

Construction and design features of the experimental continuously reinforced concrete pavement placed in Illinois in 1947 are described. The performance of the pavement up to an age of about four years is assessed with stresses in the longitudinal steel, frequency and width of transverse cracks, localized failures and general condition of the pavement being discussed. Economic possibilities of this type of pavement are not considered because of insufficient service life.

EFFECTS OF TEMPERATURE CHANGES ON CONCRETE AS INFLUENCED BY AGGREGATES....48-44

Price 50 cents.

STANTON WALKER, D. L. BLOEM and W. G. MULLEN—Apr. 1952, pp. 661-680 (V. 48)

Summarizes tests of concrete and mortar exposed to water and air temperatures ranging from 40-140 F with varying rates of change in temperature. Changes in length, weight, dynamic modulus and flexural strength were measured on specimens containing several different fine and coarse aggregates having thermal coefficients of expansion ranging from relatively low to relatively high. Principal findings of the tests were: thermal coefficients of expansion of concrete and mortar containing different aggregates varied approximately in proportion to the thermal coefficient and quantity of aggregate in the mixture; an approximation of the thermal coefficient of expansion of aggregate may be made from determinations of the thermal coefficients of concrete of varying proportions; changes in temperature were destructive to the concrete with sudden changes being much more severe than slower ones; and concretes having higher coefficients of expansion were less resistant to temperature changes than concretes with lower coefficients. No relationship was found between resistance of concrete to temperature changes and differences between thermal coefficients of aggregates and mortar.

BOND PROPERTIES OF WELDED WIRE FABRIC.....48-45

Price 50 cents.

ARTHUR R. ANDERSON—Apr. 1952, pp. 681-692 (V. 48)

A wealth of information has been published on bond between concrete and bar reinforcement, but little is known about the bond properties of welded wire fabric reinforcement. Welded wire fabric is widely used as concrete reinforcement, but bond properties have not been clearly established or specified in codes.

The tests reported indicated that the bond stress theory as applied to smooth or deformed bars is not applicable to welded wire fabric. The latter's resistance to slip is not a function of the contact area of the longitudinal wire in the concrete, on the contrary it is dependent on the anchoring ability of the transverse welded wires. The range of the sizes tested show that two welded transverse wires develop sufficient anchorage to develop the ultimate strength of the pulled-out wire.

CURING OF CONCRETE.....48-46

Price 50 cents.

A. G. TIMMS, D. L. ROBINSON, H. J. GILKEY, ROY W. CARLSON and W. R. JOHNSON, C. E. BURNETT and H. C. VOLLMER—May 1952, pp. 701-724 (V. 48)

Techniques for concrete must consider all the conditions, both natural and artificial, that affect the extent and rate of cement hydration. Well-cured concrete does not just happen; it is caused by exercising careful control over the moisture content and temperature of the concrete.

A survey of pavement curing methods in the 48 states indicates fairly uniform practice in initial curing methods but wide variations in final curing methods and total time of application. The initial curing method most widely permitted is covering with saturated burlap. For final curing, saturated cotton, felt or jute mats, membrane compounds, waterproof paper, saturated earth or ponding and covering with hay or straw are permitted. Length of curing period varies from 72 hours to 7 or more days.

A summary of the factors which relate especially to the curing of concrete in building construction emphasizes where and how these differ from some of the problems encountered in other fields. Current practices, especially with regard to form removal and to temperature and moisture control in cold weather are discussed.

Problems in curing mass concrete are similar to those for smaller sections with the addition of consideration of heat of hydration. Methods used must control the temperature differential between the face and interior of the massive sections. Some remedial measures are creating low temperature in the concrete when placing, limiting the height and rapidity with which the lifts are placed, use of embedded cooling systems or using steel forms which help dissipate the heat. A summary of the recommended curing practices for mass concrete based on the most recent report of Committee 612 is included.

A discussion of membrane curing methods for concrete canal linings points out that white pigmented compound is preferred. Good material, proper time of application, adequate film thickness, and uniform coverage are important.

Standard laboratory and field curing methods are summarized. The influence of economy in the standardization and establishment of acceptable curing specifications is discussed. Use of calcium chloride as a surface treatment or integrally for curing purposes, is explained.

DURABILITY.....48-47

Price 50 cents.

C. B. PORTER, R. W. GILMORE, F. H. JACKSON, LEWIS H. TUTHILL and BYRAM W. STEELE—May 1952, pp. 725-752 (V. 48)

Report on conditions affecting durability of concrete structures, and discussion of design modifications and changes in construction and maintenance procedures to prolong their useful life.

Surveys of structures of various ages and an evaluation of factors affecting their durability. Brief report of research on testing and developing waterproofing materials. A brief discussion of the factors that control durability of concrete pavements. Structural performance and durability are defined and their relationship to each other and to water-cement ratio brought out. The role of air entrainment in improving the durability of concrete pavements, particularly under the attack of chloride salts used for ice removal, is discussed and present thinking on the subject summarized.

The necessity of controlling volume change and providing impermeability in mass concrete hydraulic structures contributes to the problems of durability. Mix design, placement methods, use of admixtures and other measures to increase the serviceability of such work are considered. The need for impermeable concrete is stressed as the primary requirement for lasting durability of mass hydraulic structures. Research in all phases of concrete mix and design is recommended as the answer to the need for a method of evaluating permeability in regard to its permanent effect on the durability of concrete thus establishing a realistic approach to specifying cement content of concrete mixtures in which strength is of secondary importance.

ELECTRIC HEATING OF CONCRETE IN WINTER CONSTRUCTION.....48-48

Price 50 cents.

CHUZO ITAKURA—May 1952, pp. 753-768 (V. 48)

Describes an electrical method of heating concrete in cold weather which has been used in about 80 structures in northern Japan. The structures ranged from simple piers for wooden buildings to abutments and piers 82 ft high. The system, employing a network of electrodes, is applicable to plain or reinforced concrete. The cost of curing by this method varies from 7 to 10 percent of construction cost for plain concrete to 10 to 15 percent for reinforced concrete.

FIELD PROBLEMS IN CONSTRUCTING A PRESTRESSED CONCRETE BRIDGE.....48-49

Price 35 cents.

CLAIR L. JOHNSON—May 1952, pp. 769-772 (V. 48)

Discusses design considerations for a prestressed concrete bridge in which the girders were assembled from precast blocks grouted after completion of the members. Field experience showed that a reduction in the number of shapes of blocks used was desirable and resulted in lower over-all cost. Breakage of blocks and difficulties in grouting between blocks were overcome by modification of assembling technique, changes in design and the development of re-usable joint covers. Bid prices on three successive jobs indicate that with familiarity with prestressed construction the cost tends to drop.

ECONOMY AND CONCRETE BEAMS.....48-50

Price 50 cents.

HERBERT A. SAWYER, JR.—May 1952, pp. 773-784 (V. 48)

Relationships and charts are presented from which may be readily determined the cross-sectional dimensions for maximum economy of materials for a beam or slab with given span and loading. Whitney's theory is used to express beam strength. The steel saving possibilities of economical dimensioning are considered and found especially important.

These optimum dimensions almost never correspond to balanced design, but depend on relative material costs, relative material strengths, relative length of beam reinforced for diagonal tension, and relative importance of beam dead weight.

Optimum dimensions for the Whitney theory also serve as a general guide to efficient design by the elastic theory.

INTRODUCTION TO ULTIMATE LOAD DESIGN.....48-51

Price 35 cents.

LEO H. CORNING—June 1952, pp. 797-800 (V. 48)

Review of the history of ultimate load design. Cites precedent for ultimate load design here and in foreign countries with some consideration of the load factors they require.

WHY DESIGN BY THE ULTIMATE STRENGTH THEORIES?..48-52

Price 35 cents.

BOYD G. ANDERSON (Disc. by JOHN I. PARCEL)—June 1952, pp. 801-808 (V. 48)

Discusses following reasons for ultimate design: to bring the design of concrete members into one common rational basis; to make the factor of safety for all shapes the same; to rationalize the use of load factors so that different factors of safety can be assigned to different types of loading and different types of structures; to prevent uneconomical use of compressive reinforcement; to simplify design procedure; to better predict performance of structures subject to long-duration impulsive loads; and to determine capacities of prestressed concrete members.

FUNDAMENTAL CONCEPTS IN ULTIMATE LOAD DESIGN OF REINFORCED CONCRETE MEMBERS.48-53

Price 50 cents.

EIVIND HOGNESTAD (Disc. by VERNON P. JENSEN)—June 1952, pp. 809-832 (V. 48)

The work of the pioneers of reinforced concrete design was directed primarily towards predicting the strength of members. Ultimate load design is, therefore not a recent development. In principle it is older than the straight-line theory.

The fundamental concepts in ultimate load design of reinforced concrete members are discussed with particular emphasis on the basic assumptions involved, and most common design equations are presented.

It is pointed out that a desirable structure does not necessarily result from *truly balanced design*, which is characterized by several modes of failure being equally probable. The view is advanced that particularly undesirable modes of failure, such as those having a brittle nature, should be made less probable than modes of failure associated with ductility and warning of distress.

REVIEW OF RESEARCH ON ULTIMATE STRENGTH OF REINFORCED CONCRETE MEMBERS.....48-54

Price 60 cents.

C. P. SIESS (Disc. by GEORGE C. ERNST and ALFRED L. PARME)—June 1952, pp. 833-864 (V. 48)

Extensive and sometimes comprehensive research on the ultimate strength of reinforced concrete members has been carried on almost since the first use of this structural material. This paper reviews briefly some of the more significant work in this field, both experimental and analytical. The scope is limited to statically determinate isolated reinforced concrete structural elements, divided for the purposes of discussion into five categories depending on the predominant type of stress to which they are subjected: (1) pure flexure, (2) axial compression, (3) combined axial compression and flexure, (4) combined flexure and shear, and (5) combined flexure, shear and axial compression. The paper is not intended to be comprehensive; only those tests and theories are discussed that serve best to give an over-all picture of the development and scope of research on ultimate strength of reinforced concrete members.

PRACTICAL DESIGN AT ULTIMATE LOADS.....48-55

Price 50 cents.

R. C. REESE (Disc. by PHIL M. FERGUSON)—June 1952, pp. 865-880 (V. 48)

After a few comments on the fundamental philosophy of ultimate load design, a short discussion of the formulas used for practical design (rectangular stress prism) is given. Designs are carried out for slabs and beams and for columns with and without bending by the conventional and ultimate load design methods. Some comparisons are made of the results as regards amount of space occupied, time sagging of members and cost of construction. Remarks are offered on the appropriateness of using elastic frame analysis, plastic theories and the various ultimate stress prisms.

LOAD FACTORS IN ULTIMATE DESIGN OF REINFORCED CONCRETE.....48-56

Price 50 cents.

T. Y. LIN (Disc. by RAYMOND ARCHIBALD)—June 1952, pp. 881-900 (V. 48)

Reasons for margins of safety are discussed. Shortcomings of the present method of allowable stresses are enumerated and bases for the choice of load factors in ultimate design are explained. Tentative load factors are proposed.

DISCUSSION

Discussion closed January 1, 1952

Sept. Jl. '51

Earthquake Resistant Design Considerations—R. R. Martel

Comprehensive Numerical Method for the Analysis of Earthquake Resistant Structures—Charles S. Whitney, Boyd G. Anderson and Mario G. Salvadori

Multistory Buildings Designed to Resist Earthquakes—John J. Gould

Lightweight Concrete for Lower Construction Costs—J. A. Murlin

Designing for Continuity in Prestressed Concrete Structures—Alfred L. Parme and George H. Paris

Pumice—Lightweight Aggregate—Leslie I. Neher

Hydration Products Formed in Cement Pastes at 25 to 175 C—George L. Kalousek and Milton Adams

Discussion closed February 1, 1952

Oct. Jl. '51

Advances in Precast Floor Systems—F. N. Menefee

Manufacture and Use of Machine-Made Precast Structural Elements—A. G. Streblow

Tilt-up Construction in Western United States—F. Thomas Collins

Diagonal Tension in Reinforced Concrete Beams—Arthur P. Clark

Coral and Salt Water as Concrete Materials—John G. Dempsey

Load Carrying Capacity of Dowels at Transverse Pavement Joints—Henri Marcus

Discussion closed March 1, 1952

Nov. Jl. '51

Tilt-Up Construction Costs—F. Thomas Collins and Earl Bennetsen

Effect of Temperature and Surface Area of the Cement on Air Entrainment—E. W. Scripture, Jr., S. W. Benedict and F. J. Litwinowicz

Foundation for a Large Turbogenerator—Paul Rogers

Measurement of the Distribution of Tensile and Bond Stresses Along Reinforcing Bars—R. M. Mains

Insulation for Protection of New Concrete in Winter—L. H. Tuthill, R. E. Glover, C. H. Spencer and W. B. Bierce

Discussion closed April 1, 1952

Dec. Jl. '51

Lateral Force Distribution in a Concrete Building Story—T. Y. Lin

Air Entrainment and Resistance to Freezing and Thawing—E. W. Scripture, Jr., S. W. Benedict and F. J. Litwinowicz

Streamlined Vacuum Concrete Buntons for Mine Shafts—Peter J. Doanides

Simple Concrete Shell Structures—Felix Candela

Concrete Footings for Walls and Columns—Paul Jakowlew-Herbaczewski

Discussion closed May 1, 1952

Jan. Jl. '52

Field Experiences in Building Multiple Story Reinforced Concrete Tanks—E. J. Critzas

Conservation of Steel by Design—O. W. Irwin

Automatic Jacks Speed Sliding-Form Construction—David F. Stout and Robert E. Wilde

Shrinkage and Curing in Concrete Masonry Units—Harry W. Easterly, Jr.

Equivalent Load Method for Analyzing Prestressed Concrete Structures—Robert B. B. Moorman

Why Small Jobs Frequently Get Poor Concrete—A. W. Brust

Discussion closed June 1, 1952

Feb. Jl. '52

Analysis of Skewed Rigid Frames and Arches—James P. Michalos

Use of Chicago Fly Ash in Reducing Cement-Aggregate Reaction—C. H. Scholer and G. M. Smith

Direct Design of Rectangular Columns with Bending About an Axis of Symmetry—Henry J. Cowan

Thermal Expansion of Aggregates and Concrete Durability—Edwin J. Callan

Relative Economy of Prestressed and Conventional Reinforced Concrete Reservoirs—G. C. Ernst, C. O. Brunken and A. R. Riveland

Discussion closes July 1, 1952

Mar. Jl. '52

New Techniques in the Study of Setting and Hardening of Hydraulic Materials—J. Calleja

Calcium Chloride in Concrete—J. J. Shideler

Reinforcing Steel in Concrete and the Concept of Safety—K. Hajnal-Konyi

Applications of Vacuum Concrete—K. P. Billner

Discussion closes August 1, 1952

Apr. Jl. '52

Exciting Adventures—H. F. Thomson

Wave Velocity in Concrete—Johannes Andersen and Poul Nerenst

Slip-Forms for Concrete Canal Lining—T. V. D. Woodford

Short Cuts in the Design of Continuous Structures—I. E. Morris

Illinois Experimental Continuously Reinforced Concrete Pavement after Four Years—J. D. Lindsay and H. W. Russell

Effects of Temperature Changes on Concrete as Influenced by Aggregates—Stanton Walker D. L. Bloem and W. G. Mullen

Bond Properties of Welded Wire Fabric—Arthur R. Anderson

Discussion closes September 1, 1952

May Jl. '52

Curing of Concrete—A. G. Timms, D. L. Robinson, H. J. Gilkey, Roy W. Carlson and W. R. Johnson, G. E. Burnett and H. C. Vollmer

Durability—C. B. Porter, R. W. Gilmore, F. H. Jackson, Lewis H. Tuthill and Byram W. Steele

Electric Heating of Concrete in Winter Construction—Chuzo Itakura

Field Problems in Constructing a Prestressed Concrete Bridge—Clair L. Johnson

Economy and Concrete Beams—Herbert A. Sawyer, Jr.

ALPHABETICAL LIST OF ADVERTISERS

(Page numbers refer to News Letter)

Autolene Lubricants Co. 19
Baldwin-Lima-Hamilton Corporation ..... 14 and 15
Bethlehem Steel Company 21
Chain Belt Company 22
L. Coff 17
Dewey and Almy Chemical Company 8
Fuller Co., The 23
Granco Steel Products Company 18
Intrusion-Prepakt, Inc. 2
Jaeger Machine Company 13
Laclede Steel Company 25
Lone Star Cement Corporation ..... Inside front cover
Master Builders Company 26
Solvay Sales Division, Allied Chemical and Dye Corporation 7
Western Waterproofing Co. of Missouri 16
Williams Form Engineering Corp. 17

The Institute assumes no responsibility for the claims of advertisers. The advertiser is made responsible in the belief that his place in the field will be determined by the public's ultimate measure of his exercise of that responsibility.

Discussion closes September 1, 1952

June Jl. '52

Introduction to Ultimate Load Design—Leo H. Corning

Why Design by the Ultimate Strength Theories?—Boyd G. Anderson

Fundamental Concepts in Ultimate Load Design of Reinforced Concrete Members—Eivind Hognestad

Review of Research on Ultimate Strength of Reinforced Concrete Members—C. P. Siess

Practical Design at Ultimate Loads—R. C. Reese

Load Factors in Ultimate Design of Reinforced Concrete—T. Y. Lin

INDEX TO *Proceedings*

AMERICAN CONCRETE INSTITUTE

VOLUME 48—1952

From JOURNAL OF THE AMERICAN CONCRETE INSTITUTE, V. 23, Sept. 1951 to June 1952 and Part 2, December 1952

Original contributions to the JOURNAL OF THE AMERICAN CONCRETE INSTITUTE—papers, reports and discussions—are indexed in three categories;

1. Title ..... **Manufacture and use of machine-made precast structural elements (48-9)** A. G. Streblow Oct. 1951..... 125

2. Author ..... **Streblow, A. G.**—Manufacture and use of machine-made precast structural elements (**48-9**) Oct. 1951..... 125

3. Subject ..... **Precast slabs**—Systems (**48-9**) Oct. 1951... 125

Numbers in parentheses with each entry constitute the title number of the article. The bold face portion indicates the number of the *Proceedings* volume (in this case V. 48) in which the topic appears. The month and year indicate the JOURNAL issue. Page numbers of both *Proceedings* and JOURNAL are the same.

Letters from Readers items include "LR" in the parentheses: **Anchor bolts**—Column bases (**LR 48-17**) Dec. 1951..... 356

again the bold face number is the *Proceedings* volume number.

The index to Current Reviews published in this volume begins on p. 922

A

Adams, Milton — Hydration products formed in cement pastes at 25 to 175 C (**48**-7) Sept. 1951 77

Adams, R. W., Sr.—Disc. Advances in precast floor systems (**48**-8) Part 2, Dec. 1952 124–1

Advances in precast floor systems (**48**-8)
–F. N. Menefee Oct. 1951 113
–Disc. Ralph W. Adams, Sr., F. A. Biberstein, Albyn Mackintosh, O. Neil Olson, Hugh M. O'Neil and Author Part 2, Dec. 1952 124–1

Age — Concrete — Wave velocity (**48**-40) Apr. 1952 613

Aggregate
–Coral (**48**-12) Oct. 1951 157
–Temperature changes—Thermal properties (**48**-44) Apr. 1952 661
–Thermal expansion (**48**-33) Feb. 1952 485
–Types — Relation to cement (**LR 48**-30) June 1952 903

Air — Determination — Concrete (**LR 48**-26) May 1952 785

Air — Measurement — Hardened concrete (**LR 48**-28) June 1952 901

Air entrainment
–Durability (**48**-47) May 1952 725
–Resistance to freezing and thawing (**48**-20) Dec. 1951 297

Air entrainment and resistance to freezing and thawing (**48**-20)
–E. W. Scripture, Jr., S. W. Benedict and F. J. Litwinowicz Dec. 1951 297
–Disc. D. G. Kretsinger and Authors Part 2, Dec. 1952 308–1

Air-entraining agents—Tests (**48**-20) Dec. 1951 297

Alkalies—Cement—Solubility (**LR 48**-5) Sept. 1951 97

Alkali-aggregate expansion
–Correction (**LR 48**-3) Sept. 1951 95
–Inhibition (**LR 48**-19) Feb. 1952 513

Alkali-aggregate reaction
–Calcium chloride (**48**-36) Mar. 1952 537
–Durability (**48**-47) May 1952 725

Allowable loads — Dowels — Horizontal (**48**-13) Oct. 1951 169

Analysis of skewed rigid frames and arches (**48**-30)
–James P. Michalos Feb. 1952 437
–Disc. Maurice Barron and Author Part 2, Dec. 1952 456–1

Anchor bolts
–Column bases (**LR 48**-17) Dec. 1951 356
–Allowable shear load. Disc. (**48**-13) Part 2, Dec. 1952 184–1

Anchorage—Welded wire fabric (**48**-45) Apr. 1952 681

Andersen, Johannes—Wave velocity in concrete (**48**-40) Apr. 1952 613

Anderson, Arthur R.—Bond properties of welded wire fabric (**48**-45) Apr. 1952 681

Anderson, Boyd G.
–Comprehensive numerical method for the analysis of earthquake resistant structures (**48**-2) Sept. 1951 5
–Why design by ultimate strength theories (**48**-52) June 1952 801

Applications of vacuum concrete (**48**-38) K. P. Billner Mar. 1952 581

Arches—Numerical analysis—Skewed single span (**48**-30) Feb. 1952 437

Archibald, Raymond—Disc. Load factors in ultimate design of reinforced concrete (**48**-56) June 1952 898

Armstrong, S.—Disc. Review of research on ultimate strength of reinforced concrete members (**48**-54) Part 2, Dec. 1952 864–1

Automatic form leveling—Electric jacks (**48**-26) Jan. 1952 381

Automatic jacks speed sliding-form construction (**48**-26) David F. Stout and Robert E. Wilde Jan. 1952 381

Axial compression
–Research review (**48**-54) June 1952 833
–Ultimate load equations (**48**-53) June 1952 809

B

Barron, Maurice—Disc. Analysis of skewed rigid frames and arches (**48**-30) Part 2, Dec. 1952 456–1

Beam—Ultimate load and conventional design—Comparison (**48**-55) June 1952 ... 865

Beams
–Bond and tensile stresses—Tests (**48**-17) Nov. 1951 225
–Design (**LR 48**-12)
Oct. 1951 186
Jan. 1952 425
–Economical design—Optimum dimensions (**48**-50) May 1952 773
–Load factor—Ultimate design (**48**-56) June 1952 881
–Prestressed—Design (**48**-5) Sept. 1951 45

Bearing stress — Concrete — Uniform distribution (**48**-13) Oct. 1951 169

Benedict, S. W.
–Air entrainment and resistance to freezing and thawing (**48**-20) Dec. 1951 297
–Effect of temperature and surface area of the cement on air entrainment (**48**-15) Nov. 1951 205

Bennetsen, Earl M.—Tilt-up construction costs (**48**-14) Nov. 1951 197

Biberstein, F. A.—Disc. Advances in precast floor systems (**48**-8) Part 2, Dec. 1952 .. 124–1

Bibliography—Ultimate strength (**48**-54) June 1952 833

Bierce, W. E.—Insulation for protection of new concrete in winter (**48**-18) Nov. 1951 253

Billner, K. P.—Applications of vacuum concrete (**48**-38) Mar. 1952 581

Bleeding—Control in lightweight concrete (**48**-4) Sept. 1951 37

Bloem, D. L.
–Effects of temperature changes on concrete as influenced by aggregates (**48**-44) Apr. 1952 661
–Disc. Thermal expansion of aggregates and concrete durability (**48**-33) Part 2, Dec. 1952 504–1

Bond
–Effect—Electrical heating (**48**-48) May 1952 753
–Reinforcing steel (**48**-37) Mar. 1952 561
–Welded wire fabric (**48**-45) Apr. 1952 681

Bond breaking agents—Tilt-up construction (**48**-10) Oct. 1951 133

Bond properties of welded wire fabric (**48**-45) Arthur R. Anderson Apr. 1952 681

Bond resistance—Dowels (**48**-13) Oct. 1951 169

Bond stress distribution—Measurement (**48**-17) Nov. 1951 225

Braces—Vacuum processed (**48**-21) Dec. 1951 309

Bridge
–Free span construction (**LR 48**-14) Nov. 1951 273
–Prestressed concrete (**LR 48**-23) Feb. 1952 519

Brunken, C. O.—Relative economy of prestressed and conventional reinforced concrete reservoirs (**48**-34) Feb. 1952 505

Brust, A. W.—Why small jobs frequently get poor concrete (**48**-29) Jan. 1952 417

Building code
–Bar classification (**LR 48**-24) Mar. 1952 .. 593
–Earthquake—San Francisco (**48**-3) Sept. 1951 29
–Rational use (**LR 48**-4) Sept. 1951 96

Building multistory reinforced concrete tanks (**48**-24) E. J. Critzas Jan. 1952 365

Buildings
–Earthquake resistant design (**48**-19) Dec. 1951 281
–Vacuum concrete (**48**-38) Mar. 1952 581

Burlap—Curing (**48**-46) May 1952 701

Burnett, G. E.—Curing concrete in canal linings (**48**-46) May 1952 718

C

Calcium chloride—Curing (**48**-46) May 1952 701
–Effects on concrete (**48**-36) Mar. 1952 537
–Winter protection (**48**-18) Nov. 1951 253

Calcium chloride in concrete (48-36)
–J. J. Shideler Mar. 1952 537
–Disc. H. C. Vollmer, G. M. Williams and Author Part 2, Dec. 1952 560–1
Callan, Edwin J.—Thermal expansion of aggregates and concrete durability (48-33) Feb. 1952 485
Calleja, J.—New techniques in the study of setting and hardening of hydraulic materials (48-35) Mar. 1952 525
Canal linings
–Slip-forms (48-41) Apr. 1952 637
–Temperature computations for insulation (48-18) Nov. 1951 253
Candela, Felix—Simple concrete shell structures (48-22) Dec. 1951 321
Carlson, R. W.—Curing of mass concrete (48-46) May 1952 716
Casting platform
–Cost (48-14) Nov. 1951 197
–Tilt-up construction (48-10) Oct. 1951 133
Cement
–Alkali determination (LR 48-5) Sept. 1951 97
–Relation to aggregate (LR 48-30) June 1952 903
–Setting and hardening time (48-35) Mar. 1952 525
Cement aggregate reaction — Fly ash (48-31) Feb. 1952 457
Cement factor—Determination (LR 48-18) Jan. 1952 428
Center of rigidity—Skewed elements of building (48-19) Dec. 1951 281
Chart—Grout mix computation (LR 48-25) Mar. 1952 597
Chemical properties — Pumice (48-6) Sept. 1951 65
Chimneys—Tokyo earthquake 1923 (48-1) Sept. 1951 1
Clark, Arthur P.—Diagonal tension in reinforced concrete beams (48-11) Oct. 1951 .. 145
Collins, F. Thomas
–Tilt-up construction in western United States (48-10) Oct. 1951 133
–Tilt-up construction costs (48-14) Nov. 1951 197
Column—Ultimate load and conventional design—Comparison (48-55) June 1952 ... 865
Column bases
–Anchor bolts (LR 48-17) Dec. 1951 356
–Setting (LR 48-1) Sept. 1951 93
Column footings—Optimum dimensions (48-23) Dec. 1951 333
Columns — Eccentrically loaded — Design (48-32) Feb. 1952 465
Combined flexure and axial compression —Ultimate load equations (48-53) June 1952 809
Combined flexure and shear—Research review (48-54) June 1952 833
Comprehensive numerical method for the analysis of earthquake resistant structures (48-2)
–Charles S. Whitney, Boyd G. Anderson and Mario G. Salvadori Sept. 1951 5
–Disc. S. K. Ghaswala and Authors Part 2, Dec. 1952 28–1
Compressive strength—Concrete—Small jobs (48-29) Jan. 1952 417
Concrete
–Air-entraining (48-20) Dec. 1951 297
–Hardened—Air measurement (LR 48-28) June 1952 901
–Poor—Small jobs (48-29) Jan. 1952 417
Concrete footings for walls and columns (48-23) Paul Jakowlew-Herbaczewski Dec. 1951 333
Concrete strength — Factors affecting (LR 48-2) Sept. 1951 94
Condensation—Masonry walls (LR 48-13) Oct. 1951 188
Condenser chronograph—Wave velocity (48-40) Apr. 1952 613
Conservation of steel by design (48-25)
–O. W. Irwin Jan. 1952 373
–Disc. K. Hajnal-Konyi, Eivind Hognestad and Author Part 2, Dec. 1952 380–1
Construction
–Continuously reinforced pavement (48-43) Apr. 1952 653
–Multistory tanks (48-24) Jan. 1952 365
–Prestressed bridge (48-49) May 1952 768
–Simple skewed shells (48-22) Dec. 1951 ... 321
–Sliding forms (48-26) Jan. 1952 381
Construction practices — Small jobs (48-29) Jan. 1952 417
Continuity—Prestressed concrete (48-5) Sept. 1951 45
Continuous reinforcement — Pavement (48-43) Apr. 1952 653
Continuous structures—Design short cuts (48-42) Apr. 1952 645
Coral and salt water as concrete materials (48-12)
–John G. Dempsey Oct. 1951 157
–Disc. E. W. Scripture, Jr. and Author Part 2, Dec. 1952 168–1
Corning, Leo H.—Introduction to ultimate load (48-51) June 1952 797
Correlation of shrinkage and curing in concrete masonry units (48-27)
–Harry W. Easterly, Jr. Jan. 1952 393
–Disc. Albyn Mackintosh, M. Spindel and Author Part 2, Dec. 1952 404–1
Corrosion — Reinforcing steel — Calcium chloride (48-36) Mar. 1952 537
Cost
–Beams (48-50) May 1952 773
–Canal linings—Slip-forms (48-41) Apr. 1952 637
–Continuously reinforced pavement (48-43) Apr. 1952 653
–Electric curing (48-48) May 1952 753
–Erection—Precast members (48-10) Oct. 1951 133
–Lightweight concrete (48-4) Sept. 1951 ... 37
–Preliminary analysis (48-42) Apr. 1952 645
Cost comparison—Ultimate load and conventional design (48-55) June 1952 865
Cost survey—Prestressed and conventional design (48-34) Feb. 1952 505
Costs—Tilt-up construction—Computation (48-14) Nov. 1951 197
Cowan, Henry J.
–Direct design of rectangular columns with bending about an axis of symmetry (48-32) Feb. 1952 465
–Disc. Practical design at ultimate loads (48-55) Part 2, Dec. 1952 880–1
–Disc. Review of research on ultimate strength of reinforced concrete members (48-54) Part 2, Dec. 1952 864–1
Cracking
–Beams (48-17) Nov. 1951 25
–Causes (48-47) May 1952 725
–Dowels (48-13) Oct. 1951 169
Cracks
–Beams—Diagonal tension (48-11) Oct. 1951 145
–Continuously reinforced pavement (48-43) Apr. 1952 653
–Reinforced concrete (48-37) Mar. 1952 561
–Tunnel lining (LR 48-10) Oct. 1951 185
–Tunnel lining (LR 48-10) Jan. 1952 425
Critzas, E. J.—Building multistory reinforced concrete tanks (48-24) Jan. 1952 ... 365
Curing
–Electrical (48-48) May 1952 753
–Masonry units (48-27) Jan. 1952 393
–Methods and practices—Economy (48-46) May 1952 701
–Winter (48-18) Nov. 1951 253
Curing of concrete (48-46)
–Symposium May 1952 701
–Disc. M. Spindel and H. J. Gilkey Part 2, Dec. 1952 724–1

D

Dead load factors—Ultimate design (48-56) June 1952 881
Deflection—Member in turbine foundation (48-16) Nov. 1951 213
Dempsey, John G.—Coral and salt water as concrete materials (48-12) Oct. 1951 157
Design
–Beams
(48-50) May 1952 773
(LR 48-12) Oct. 1951 186
(LR 48-12) Jan. 1952 425
–Building — Conformance to earthquake specifications (48-3) Sept. 1951 29

–Buildings — Lateral force distribution (48-19) Dec. 1951 281
–Continuous structures—Short cuts (48-42) Apr. 1952 645
–Continuously reinforced pavement (48-43) Apr. 1952 653
–Earthquake — Rational method (48-2) Sept. 1951 5
–Earthquake consideration (48-1) Sept. 1951 1
–Eccentrically loaded columns (48-32) Feb. 1952 465
–Footings—Economy (48-23) Dec. 1951 333
–Multistory tanks (48-24) Jan. 1952 365
–Prestressed beams (48-5) Sept. 1951 45
–Prestressed bridge (48-49) May 1952 769
–Pumice mixtures (48-6) Sept. 1951 65
–Reservoirs—Factors influencing economy (48-34) Feb. 1952 505
–Simple and skewed shells (48-22) Dec. 1951 321
–Standardization (LR 48-31) June 1952 904
–Steel conservation (48-25) Jan. 1952 373
–Tilt-up wall panels (48-10) Oct. 1951 133
–Turbogenerator foundation (48-16) Nov. 1951 213
–Ultimate load method
(48-51) June 1952 797
(48-53) June 1952 809
(48-55) June 1952 865
–Vacuum processed braces (48-21) Dec. 1951 309
Designing for continuity in prestressed concrete structures (48-5)
–Alfred L. Parme and George H. Paris Sept. 1951 45
–Disc. Juhan Raud and Authors Part 2, Dec. 1952 64–1
Deterioration—Causes and remedies (48-47) May 1952 725
Diagonal tension—Beams (LR 48-6) Sept. 1951 98
Diagonal tension in reinforced concrete beams (48-11)
–Arthur P. Clark Oct. 1951 145
–Disc. Phil M. Ferguson, Oreste Moretto, I. E. Morris, Douglas E. Parsons, Grover L. Rogers, Robert S. Rowe and Author Part 2, Dec. 1952 156–1
Differential thermal analysis—Cement pastes (48-7) Sept. 1951 77
Direct design of rectangular columns with bending about an axis of symmetry (48-32) Henry J. Cowan Feb. 1952 465
Disario, P. C.—Disc. Load carrying capacity of dowels at transverse pavement joints (48-13) Part 2, Dec. 1952 184–1
Doanides, Peter J.—Streamlined vacuum concrete buntons for mine shafts (48-21) Dec. 1951 309
Dowels—Load carrying capacity—Transverse joints (48-13) Oct. 1951 169
Dox system—Precast blocks (48-8) Oct. 1951 113
Drainage—Durability factor (48-47) May 1952 725
Durability
–Aggregates (48-33) Feb. 1952 485
–Effect of air entrainment (48-20) Dec. 1951 297
–Recommended practices (48-47) May 1952 725
Durability (48-47)
–Symposium May 1952 725
–Disc. M. Spindel and Byram W. Steele Part 2, Dec. 1952 752–1
Dynamic modulus—Temperature change influence (48-44) Apr. 1952 661

E

Earthquake displacements—Function of time (48-2) Sept. 1951 5
Earthquake resistant design
–Buildings (48-3) Sept. 1951 29
–Lateral force distribution (48-19) Dec. 1951 281
Earthquake resistant design consideration (48-1) R. R. Martel Sept. 1951 1
Easterly, Harry W., Jr.—Correlation of shrinkage and curing in concrete masonry units (48-27) Jan. 1952 393
Eccentric loads—Columns (48-32) Feb. 1952 465
Economy
–Footing design (48-23) Dec. 1951 333
–Structural design (LR 48-4) Sept. 1951 96
Economy and concrete beams (48-50) Herbert A. Sawyer, Jr. May 1952 773
Effect of temperature and surface area of the cement on air entrainment (48-15) E. W. Scripture, Jr., S. W. Benedict and F. J. Litwinowicz Nov. 1951 205
Effects of temperature changes on concrete as influenced by aggregates (48-44) Stanton Walker, D. L. Bloem and W. G. Mullen Apr. 1952 661
Electric heating of concrete in winter construction (48-48) Chuzo Itakura May 1952 753
Electrical resistance—Variation during setting (48-35) Mar. 1952 525
Elevators — Grain storage — Sliding-form construction (48-26) Jan. 1952 381
Embedment—Dowels—Load carrying capacity (48-13) Oct. 1951 169
Equivalent load method for analyzing prestressed concrete structures (48-28) Robert B. B. Moorman Jan. 1952 405
Erection—Precast members (48-10) Oct. 1951 133
Erection cost—Tilt-up construction (48-14) Nov 1951 197
Ernst, G. G.
–Relative economy of prestressed and conventional reinforced concrete reservoirs (48-34) Feb. 1952 505
–Disc. Review of research on ultimate strength of reinforced concrete members (48-54) June 1952 859
Erosion—Calcium chloride (48-36) Mar. 1952 537
Expansion joint—Fillers (LR 48-15) Nov. 1951 273
Exciting adventures (48-39) Harry F. Thomson Apr. 1952 609

F

F and A system—Precast joist and filler block (48-8) Oct. 1951 113
Facing—Precast slabs—Vacuum concrete (48-38) Mar. 1952 581
Failures — Reinforced concrete (48-37) Mar. 1952 561
Fairbanks, H. K.—Disc. Foundation for a large turbogenerator (48-16) Part 2, Dec. 1952 224–1
Farhan system—Precast slab (48-8) Oct. 1951 113
Feld, Jacob—Disc. Lightweight concrete for lower construction costs (48-4) Part 2, Dec. 1952 44–1
Ferguson, Phil M.
–Disc. Diagonal tension in reinforced concrete beams (48-11) Part 2, Dec. 1952 156–1
–Disc. Practical design at ultimate load (48-55) June 1952 877
Field control—Lightweight concrete (48-4) Sept. 1951 37
Field problems in constructing a prestressed concrete bridge (48-49) Clair L. Johnson May 1952 769
Finishing
–Fly ash effect (48-31) Feb. 1952 457
–Sliding-form construction (48-26) Jan. 1952 381
Fire resistance
–Prestressed concrete (LR 48-27) May 1952 786
–Pumice concrete (48-6) Sept. 1951 65
Flat slab—Earthquake resistant design (48-3) Sept. 1951 29
Flexure—Ultimate load equations (48-53) June 1952 809
Fly ash—Cement-aggregate reaction (48-31) Feb. 1952 457
Footings—Wall and column (48-23) Dec. 1951 333
Forces
–Earthquakes (48-1) Sept. 1951 1
–Turbine foundations (48-16) Nov. 1951 ... 213
Forming methods—Tilt-up construction (48-10) Oct. 1951 133

Forms
–Curved—Tank corners (**48**-24) Jan. 1952.. 365
–Insulated (**48**-18) Nov. 1951..... 253
Foundation for a large turbogenerator (**48**-16)
–Paul Rogers Nov. 1951 213
–Disc. H. K. Fairbanks, Robert H. Hawthorne and Author Part 2, Dec. 1952.....224–1
Foundations—Multistory tanks (**48**-24) Jan. 1952..... 365
Frame constants—Nonprismatic members (**LR 48**-29) May 1952..... 786
Free span bridge construction (**LR 48**-14) Nov. 1951..... 273
Freeze-thaw resistance — Air-entraining concrete (**48**-20) Dec. 1951..... 297
Freezing of concrete—Calcium chloride (**48**-36) Mar. 1952..... 537
Frost action—Durability (**48**-47) May 1952 725
Fundamental concepts in ultimate load design of reinforced concrete members (**48**-53)
–Eivind Hognestad June 1952..... 809
–Disc. Vernon P. Jensen June 1952..... 828

G

Gilkey, H. J.—Curing structural concrete (**48**-46) May 1952..... 711
Ghaswala, S. K.—Disc. Comprehensive numerical method for the analysis of earthquake resistant structures (**48**-2) Part 2, Dec. 1952..... 28–1
Gilmore, R. W.—Railway concrete deterioration (**48**-47) May 1952..... 731
Girder — Box type — Prestressed (**48**-49) May 1952..... 769
Glover, R. E.
–Insulation for protection of new concrete in winter (**48**-18) Nov. 1951..... 253
–Disc. Thermal expansion of aggregates and concrete durability (**48**-33) Part 2, Dec. 1952.....504–1
Gould, John J.—Multistory buildings designed to resist earthquakes (**48**-3) Sept. 1951..... 29
Grading—Coral (**48**-12) Oct. 1951..... 157
Grout—Mix computation (**LR 48**-25) Mar. 1952..... 597
Gypsum—Cement addition—Effect on hydration (**48**-7) Sept. 1951..... 77

H

Hajnal-Konyi, K.
–Reinforcing steel in concrete and the concept of safety (**48**-37) Mar. 1952..... 561
–Disc. Conservation of steel by design (**48**-25) Part 2, Dec. 1952.....380–1
Half-sine pulses—Earthquake (**48**-2) Sept. 1951..... 5
Hart, Clyde—Disc. Multistory buildings designed to resist earthquakes (**48**-3) Part 2, Dec. 1952..... 36–1
Hawthorne, R. H.—Disc. Foundation for a large turbogenerator (**48**-16) Part 2, Dec. 1952.....224–1
Heat generation—Concrete (**48**-18) Nov. 1951..... 253
Heat of hydration — Calcium chloride (**48**-36) Mar. 1952..... 537
High-pressure steam curing
–(**48**-46) May 1952..... 701
–Masonry units (**48**-27) Jan. 1952..... 393
Historical background—Ultimate load design (**48**-53) June 1952..... 809
Hobbs, Samuel—Disc. Tilt-up construction in western United States (**48**-10) Part 2, Dec. 1952.....144–1
Hogg, A. D.—Disc. Measurement of the distribution of tensile and bond stresses along reinforcing bars (**48**-17) Part 2, Dec. 1952...252–1
Hognestad, Eivind
–Fundamental concepts in ultimate load design of reinforced concrete members (**48**-53) June 1952..... 809
–Disc. Conservation of steel by design (**48**-25) Part 2, Dec. 1952.....380–1
–Disc. Reinforcing steel in concrete and the concept of safety (**48**-37) Part 2, Dec. 1952.....580–1
Hooks—Reinforcing bars (**LR 48**-9) Sept. 1951..... 104
Howard, E. L.—Disc. Multistory buildings designed to resist earthquakes (**48**-3) Part 2, Dec. 1952..... 36–1
Hydration products formed in cement pastes at 25 to 175 C (**48**-7) George L. Kalousek and Milton Adams Sept. 1951.... 77
Hydraulic structures—Durability (**48**-47) May 1952..... 725
Hydrogarnets—Cement pastes (**48**-7) Sept. 1951..... 77

I

Illinois experimental continuously reinforced concrete pavement after four years (**48**-43) J. D. Lindsay and H. W. Russell Apr. 1952..... 653
Impermeability—Durability effect (**48**-47) May 1952..... 725
Influence lines—Horizontal shear—Earthquake (**48**-1) Sept. 1951..... 1
Initial settlement — Calcium chloride (**48**-36) Mar. 1952..... 537
Insulation
–Curing (**48**-46) May 1952..... 701
–Pumice (**48**-6) Sept. 1951..... 65
–Winter concreting (**48**-18) Nov. 1951..... 253
Insulation for protection of new concrete in winter (**48**-18)
–L. H. Tuthill, R. E. Glover, C. H. Spencer and W. B. Bierce Nov. 1951..... 253
–Addendum Part 2, Dec. 1952.....272–1
Inspection—Small jobs (**48**-29) Jan. 1952.. 417
Interaction — Ground and foundation — Earthquake (**48**-2) Sept. 1951 5
Introduction to ultimate load design (**48**-51) Leo H. Corning June 1952..... 797
Irwin, O. W.—Conservation of steel by design (**48**-25) Jan. 1952..... 373
Itakura, Chuzo—Electric heating of concrete in winter construction (**48**-48) May 1952..... 753

J

Jacks—Electric—Automatic leveling (**48**-26) Jan. 1952..... 381
Jackson, F. H.—Concrete pavements can be durable (**48**-47) May 1952..... 735
Jakowlew-Herbaczewski, Paul—Concrete footings for walls and columns (**48**-23) Dec. 1951..... 333
Jensen, Vernon P.—Disc. Fundamental concepts in ultimate load design of reinforced concrete members (**48**-53) June 1952 828
Johnson, Clair L.—Field problems in constructing a prestressed concrete bridge (**48**-49) May 1952..... 769
Johnson, W. R.—Curing of mass concrete (**48**-46) May 1952..... 716
Joint fillers—Comparative tests (**LR 48**-15) Nov. 1951..... 273
Jointing—Prestressed block girder (**48**-49) May 1952..... 769
JoisTile system—Precast joist and tile filler (**48**-8) Oct. 1951..... 113
Jones R.—Disc. Wave velocity in concrete (**48**-40) Part 2, Dec. 1952.....636–1

K

Kalousek, George L.—Hydration products formed in cement pastes at 25 to 175 C (**48**-7) Sept. 1951..... 77
Kelly ball—Slump test (**LR 48**-16) Dec. 1951..... 353
Kretsinger, D. C.—Disc. Air entrainment and resistance to freezing and thawing (**48**-20) Part 2, Dec. 1952.....308–1

L

Lateral force distribution in a concrete building story (48-19) T. Y. Lin Dec. 1951 281
Lateral load distribution—Earthquake resistant design (48-3) Sept. 1951 29
Leslie, J. R.—Disc. Wave velocity in concrete (48-40) Part 2, Dec. 1952 636-1
Leveling screws—Columns (LR 48-1) Sept. 1951 93
Lightweight aggregate — Pumice (48-6) Sept. 1951 65
Lightweight concrete for lower construction costs (48-4)
–J. A. Murlin Sept. 1951 37
–Disc. Jacob Feld and Author Part 2, Dec. 1952 44-1
Lin, T. Y.
–Lateral force distribution in a concrete building story (48-19) Dec. 1951 281
–Load factors in ultimate design of reinforced concrete (48-56) June 1952 881
Lindsay, J. D.—Illinois experimental continuously reinforced concrete pavement after four years (48-43) Apr. 1952 653
Litwinowicz, F. J.
–Air entrainment and resistance to freezing and thawing (48-20) Dec. 1951 297
–Effect of temperature and surface area of the cement on air entrainment (48-15) Nov. 1951 205
Live load factors—Ultimate design (48-56) June 1952 881
Load carrying capacity of dowels at transverse pavement joints (48-13)
–Henri Marcus Oct. 1951 169
–Disc. P. C. Disario and Author Part 2, Dec. 1952 184-1
Load factors in ultimate design of reinforced concrete (48-56)
–T. Y. Lin June 1952 881
–Disc. Raymond Archibald June 1952 898
Loads
–Dynamic—Ultimate load design (48-52) June 1952 801
–Turbine foundations (48-16) Nov. 1951 ... 213

M

Mackintosh, Albyn
–Disc. Advances in precast floor systems (48-8) Part 2, Dec. 1952 124-1
–Disc. Correlation of shrinkage and curing in concrete masonry units (48-27) Part 2, Dec. 1952 404-1
Mains, R. M.—Measurement of the distribution of tensile and bond stresses along reinforced bars (48-17) Nov. 1951 225
Manufacture and use of machine-made precast structural elements (48-9) A. G. Streblow Oct. 1951 125
Marcus, Henri—Load carrying capacity of dowels at tranverse pavement joints (48-13) Oct. 1951 169
Martel, R. R.—Earthquake resistant design consideration (48-1) Sept. 1951 1
Masonry units
–Fumice (48-6) Sept. 1951 65
–Shrinkage—Curing methods (48-27) Jan. 1952 393
Masonry walls—Cold climate (LR 48-13) Oct. 1951 188
Mass concrete — Curing — Recommended practice (48-46) May 1952 701
Materials survey—Small jobs (48-29) Jan. 1952 417
Mats
–Curing (48-46) May 1952 701
–Insulating—Spun glass (48-18) Nov. 1951. 253
Measurement of the distribution of tensile and bond stresses along reinforcing bars (48-17)
–R. M. Mains Nov. 1951 225
–Disc. A. D. Hogg, L. Schenker, Aron L. Mirsky, Lyle K. Moulton, R. C. Reese and Author Part 2, Dec. 1952 252-1
Membrane curing (48-46) May 1952 701
Menefee, F. N.—Advances in precast floor systems (48-8) Oct. 1951 113
Michalos, James P.—Analysis of skewed rigid frames and arches (48-30) Feb. 1952 437
Mine shafts—Structural bracing (48-21) Dec. 1951 309
Mirsky, Aron L.—Disc. Measurement of the distribution of tensile and bond stresses along reinforcing bars (48-17) Part 2, Dec. 1952 252-1
Mix control—Salt water (48-12) Oct. 1951. 157
Mix design—Salt water (48-12) Oct. 1951.. 157
Mixing—Lightweight concrete (48-4) Sept. 1951 37
Mixtures—Durability effect (48-47) May 1952 725
Models—Earthquake force analysis (48-1) Sept. 1951 1
Moist curing (48-46) May 1952 701
Molds—Test cylinder (LR 48-7) Sept. 1951. 98
Molke, Eric C.—Disc. Simple concrete shell structures (48-22) Part 2, Dec. 1952 332-1
Moments
–Fixed end—Determination (LR 48-12) Oct. 1951 186
Jan. 1952 425
Moorman, Robert B. B.—Equivalent load method for analyzing prestressed concrete structures (48-28) Jan. 1952 405
Moretto, Oreste—Disc. Diagonal tension in reinforced concrete beams (48-11) Part 2, Dec. 1952 156
Morris, I. E.
–Short cuts in the design of continuous structures (48-42) Apr. 1952 645
–Disc. Diagonal tension in reinforced concrete beams (48-11) Part 2, Dec. 1952 156-1
Moulton, Lyle K.—Disc. Measurement of the distribution of tensile and bond stresses along reinforcing bars (48-17) Part 2, Dec. 1952 252-1
Mullen, W. G.—Effects of temperature charges on concrete as influenced by aggregates (48-44) Apr. 1952 661
Multistory buildings designed to resist earthquakes (48-3)
–John J. Gould Sept. 1951 29
–Disc. E. L. Howard and Clyde Hart Part 2, Dec. 1952 36-1
Murlin, J. A.—Lightweight concrete for lower construction costs (48-4) Sept. 1951 37

N

Neher, Leslie I. — Pumice — Lightweight aggregate (48-6) Sept. 1951 65
Nerenst, Poul—Wave velocity in concrete (48-40) Apr. 1952 613
Neutral axis—Column design (48-32) Feb. 1952 465
New techniques in the study of setting and hardening of hydraulic materials (48-35)
–J. Calleja Mar. 1952 525
–Disc. E. H. Waters and Author Part 2, Dec. 1952 536-1
Nonprismatic members—Frame constants (LR 48-29) May 1952 786
No-slump concrete—Placement (LR 48-21) Feb. 1952 514

O

Olson, O. Nell—Disc. Advances in precast floor systems (48-8) Part 2, Dec. 1952 124-1
O'Neil, Hugh M.—Disc. Advances in precast floor systems (48-8) Part 2, Dec. 1952. 124-1
Optimum air content—Air-entraining concrete (48-20) Dec. 1951 297
Overload factor—Ultimate load design (48-52) June 1952 801

P

Paper—Waterproof—Curing (**48**-46) May 1952 ... 701
Parcel, John I.—Disc. Why design by ultimate strength theories? (**48**-52) June 1952 ... 806
Paris, George H.—Designing for continuity in prestressed concrete structures (**48**-5) Sept. 1951 ... 45
Parme, Alfred L.
–Designing for continuity in prestressed concrete structures (**48**-5) Sept. 1951 ... 45
–Disc. Review of research on ultimate strength of reinforced concrete members (**48**-54) June 1952 ... 862
Parsons, Douglas E.—Disc. Diagonal tension in reinforced concrete beams (**48**-11) Part 2, Dec. 1952 ... 156
Patents—Tilt-up construction (**48**-10) Oct. 1951 ... 133
Pavement concrete—Vibration (**LR 48**-21) Feb. 1952 ... 514
Pavement—Continuously reinforced (**48**-43) Apr. 1952 ... 653
Phase X—Cement pastes (**48**-7) Sept. 1951 ... 77
Pick-up inserts—Precast members (**48**-10) Oct. 1951 ... 133
Pipes—Vacuum concrete (**48**-38) Mar. 1952. ... 581
Plastic action—Ultimate load design (**48**-55) June 1952 ... 865
Plastic theory—Skepticism (**LR 48**-8) Sept. 1951 ... 99
Ponding—Curing (**48**-46) May 1952 ... 701
Popouts—Causes (**48**-47) May 1952 ... 725
Porter, C. B.—Railway concrete (**48**-47) May 1952 ... 725
Post-tensioning load (**48**-28) Jan. 1952 ... 405
Pozzolans
–Cement-aggregate reaction (**48**-31) Feb. 1952 ... 457
–Durability (**48**-47) May 1952 ... 725
Practical design at ultimate load (**48**-55)
–R. C. Reese June 1952 ... 865
–Disc. Phil M. Ferguson June 1952 ... 878
–Disc. H. J. Cowan and Author Part 2, Dec. 1952 ... 880–1
Precast concrete — Vacuum processed (**48**-38) Mar. 1952 ... 581
Precast floor systems (**48**-8) Oct. 1951 ... 113
Precast slabs—Systems (**48**-9) Oct. 1951 ... 125
Precast walls—Tongue and groove (**48**-9) Oct. 1951 ... 125
Presaturation—Pumice aggregates (**48**-6) Sept. 1951 ... 65
President's address—Harry F. Thomson (**48**-39) Apr. 1952 ... 609
Prestressed bridge
–Construction (**48**-49) May 1952 ... 769
–(**LR 48**-23) Feb. 1952 ... 519
Prestressed concrete
–Analysis (**48**-28) Jan. 1952 ... 405
–Design (**48**-5) Sept. 1951 ... 45
–Fire resistance (**LR 48**-27) May 1952 ... 786
–Free span construction (**LR 48**-14) Nov. 1951 ... 273
Prestressed and conventional design—Economy comparison (**48**-34) Feb. 1952 ... 505
Properties—Concrete—Steel (**48**-53) June 1952 ... 809
Pulse duration—Earthquake (**48**-2) Sept. 1951 ... 5
Pumice concrete — Water content (**LR 48**-20) Feb. 1952 ... 514
Pumice—Lightweight aggregate (**48**-6) Leslie I. Neher Sept. 1951 ... 65

Q

Quartz — Cement addition — Effect on hydration (**48**-7) Sept. 1951 ... 77

R

Railway concrete deterioration—Causes (**48**-47) May 1952 ... 725
Raud, Juhan—Disc. Designing for continuity in prestressed concrete structures (**48**-5) Part 2, Dec. 1952 ... 64–1
Reagel, F. V.—Disc. Thermal expansion of aggregates and concrete durability (**48**-33) Part 2, Dec. 1952 ... 504–1
Reese, R. C.
–Practical design at ultimate load (**48**-55) June 1952 ... 865
–Disc. Foundation for a large turbo-generator (**48**-16) Part 2, Dec. 1952 ... 222–1
–Disc. Measurement of the distribution of tensile and bond stresses along reinforcing bars (**48**-17) Part 2, Dec. 1952 ... 252–1
Reinforcement—Precast slabs (**48**-9) Oct. 1951 ... 125
Reinforcing (**LR 48**-11) Oct. 1951 ... 186
Reinforcing bars — Code classification (**LR 48**-24) Mar. 1952 ... 593
Reinforcing bars—Hooked (**LR 48**-9) Sept. 1951 ... 104
Reinforcing steel
–Measurement of the distribution of tensile and bond stresses along reinforcing bars (**48**-17) Nov. 1951 ... 225
–Concept of safety (**48**-37) Mar. 1952 ... 561
–Economical percentage for footings (**48**-23) Dec. 1951 ... 333
–Optimum percentage (**48**-50) May 1952 ... 773
Reinforcing steel in concrete and the concept of safety (**48**-37)
–K. Hajnal-Konyi Mar. 1952 ... 561
–Disc. Eivind Hognestad and Author Part 2 Dec. 1952 ... 580–1
Relative economy of prestressed and conventional reinforced concrete reservoirs (**48**-34) G. C. Ernst, C. O. Brunken and A. R. Riveland Feb. 1952 ... 505
Research — Ultimate strength (**48**-54) June 1952 ... 833
Reservoir—Economical design (**48**-34) Feb. 1952 ... 505
Resonator response graph—Earthquake analysis (**48**-1) Sept. 1951 ... 1
Revetment mats — Vacuum concrete (**48**-38) Mar. 1952 ... 581
Review of research on ultimate strength of reinforced concrete members (**48**-54)
–C. P. Siess June 1952 ... 833
–Disc. G. C. Ernst and Alfred L. Parme June 1952 ... 859
–Disc. H. J. Cowan, S. Armstrong and Author Part 2, Dec. 1952 ... 864–1
Rigid frames—Numerical analysis—Skewed single span (**48**-30) Feb. 1952 ... 437
Rigidity center method — Lateral force distribution (**48**-19) Dec. 1951 ... 281
Riveland, A. R.—Relative economy of prestressed and conventional reinforced concrete reservoirs (**48**-34) Feb. 1952 ... 505
Robinson, D. L.—Current practices for curing concrete pavements (**48**-46) May 1952 ... 705
Rogers, Grover L.—Disc. Diagonal tension in reinforced concrete beams (**48**-11) Part 2, Dec. 1952 ... 156
Rogers, Paul — Foundation for a large turbogenerator (**48**-16) Nov. 1951 ... 213
Rowe, R. S.—Disc. Diagonal tension in reinforced concrete beams (**48**-11) Part 2, Dec. 1952 ... 156–1
Russell, H. W.—Illinois experimental continuously reinforced concrete pavement after four years (**48**-43) Apr. 1952 ... 653

S

Safety—Reinforcing steel—Tests (**48**-37) Mar. 1952 ... 561
Safety factor
–Ultimate load design (**48**-55) June 1952 ... 865
(**48**-52) June 1952 ... 801
Safety margin—Ultimate design (**48**-56) June 1952 ... 881
Salamanders—Curing (**48**-46) May 1952 ... 701
Salt water — Concrete — Mix (**48**-12) Oct. 1951 ... 157

Salvadori, Mario G.—Comprehensive numerical method for the analysis of earthquake resistant structures (**48**-2) Sept. 1951 5
Sawyer, Herbert A.—Economy and concrete beams (**48**-50) May 1952 773
Schenker, L.—Disc. Measurement of the distribution of tensile and bond stresses along reinforcing bars (**48**-17) Part 2, Dec. 1952 252–1
Scholer, C. H.—Use of Chicago fly ash in reducing cement-aggregate reaction (**48**-31) Feb. 1952 457
Scripture, E. W., Jr.
–Air entrainment and resistance to freezing and thawing (**48**-20) Dec. 1951 297
–Effect of temperature and surface area of the cement on air entrainment (**48**-15) Nov. 1951 205
–Disc. Coral and sea water as concrete materials (**48**-12) Part 2, Dec. 1952 168–1
Seismic factor—Earthquake considerations (**48**-1) Sept. 1951 1
Setting and hardening—Cement—Apparatus (**48**-35) Mar. 1952 525
Shear and diagonal tension—Ultimate load equations (**48**-53) June 1952 809
Shear distribution—Earthquake (**48**-3) Sept. 1951 29
Shearing stress—Stirrups (**48**-11) Oct. 1951 145
Shears—Earthquake—Influence of stiffness and rocking (**48**-2) Sept. 1951 5
Shell structures—Simple and skewed short span (**48**-22) Dec. 1951 321
Short cuts in the design of continuous structures (**48**-42) I. E. Morris Apr. 1952 645
Short-time loadings—Research review (**48**-54) June 1952 833
Shideler, J. J.—Calcium chloride in concrete (**48**-36) Mar. 1952 537
Shrinkage—Masonry units (**48**-27) Jan. 1952 393
Shrinkage specifications — Comparison (**48**-27) Jan. 1952 393
Siess, C. P.—Review of research on ultimate strength of reinforced concrete members (**48**-54) June 1952 833
Silica—Cement addition—Effect on hydration (**48**-7) Sept. 1951 77
Simple and skewed shells — Design and construction (**48**-22) Dec. 1951 321
Simple concrete shell structures (**48**-22)
–Felix Candela Dec. 1951 321
–Disc. Eric C. Molke and Author Part 2, Dec. 1952 332–1
Skew bending — Plasticity computation (**LR 48**-22) Feb. 1952 516
Skewed rigid frames and arches—Numerical analysis (**48**-30) Feb. 1952 437
Slag cement — Alkali-aggregate (**LR 48**-3) Sept. 1951 95
Sliding forms—Construction (**48**-26) Jan. 1952 381
Slip-forms—Canal linings (**48**-41) Apr. 1952 637
Slip-forms for concrete canal lining (**48**-41)
–T. V. D. Woodford Apr. 1952 637
–Disc. Lewis H. Tuthill and E. C. Wenger Part 2, Dec. 1952 644–1
Slump—Comparative tests (**LR 48**-16) Dec. 1951 353
Smith, G. M.—Use of Chicago fly ash in reducing cement-aggregate reaction (**48**-31) Feb. 1952 457
Sound absorption—Pumice (**48**-6) Sept. 1951 65
Spalling—Causes (**48**-47) May 1952 725
Spencer, C. H.—Insulation for protection of new concrete in winter (**48**-18) Nov. 1951 253
Spindel, M.
–Disc. Correlation of shrinkage and curing in concrete masonry units (**48**-27) Part 2, Dec. 1952 404–1
–Disc. Curing of concrete (**48**-46) Part 2, Dec. 1952 724–1
–Disc. Durability (**48**-47) Part 2, Dec. 1952 752–1
Steel conservation — Design (**48**-25) Jan. 1952 373
Steel design stresses — Inconsistencies (**48**-25) Jan. 1952 373
Steel girder—Design—Embedded in turbine foundation (**48**-16) Nov. 1951 213
Steel
–Allowable strength — Ultimate design (**48**-56) June 1952 881
–High yield strength—Precedent (**48**-25) Jan. 1952 373
Steele, Byram W.—Durability of hydraulic structures (**48**-47) May 1952 748
Stirrup stress—Shear applied load (**48**-11) Oct. 1951 145
Stirrups—Spacing (**LR 48**-6) Sept. 1951 98
Stout, David F.—Automatic jacks speed sliding-form construction (**48**-26) Jan. 1952 381
Strain—Load on dowels (**48**-13) Oct. 1951 169
Strain gage—Measurement of diagonal tension (**48**-11) Oct. 1951 145
Strain load — Factors — Ultimate design (**48**-56) June 1952 881
Strain measurements — Neutral axis (**48**-37) Mar. 1952 561
Streamlined vacuum concrete buntons for mine shafts (**48**-21) Peter J. Doanides Dec. 1951 309
Streblow, A. G.—Manufacture and use of machine-made precast structural elements (**48**-9) Oct. 1951 125
Strength
–Effect of air entrainment (**48**-20) Dec. 1951 297
–Electrical heating effect (**48**-48) May 1952 753
–Lightweight concrete (**48**-4) Sept. 1951 37
–Temperature change effect (**48**-44) Apr. 1952 661
–Wave velocity correlation (**48**-40) Apr. 1952 613
Strength of concrete — Compressive, flexural, tensile—Calcium chloride (**48**-36) Mar. 1952 537
Stress analysis—Prestressed concrete (**48**-5) Sept. 1951 45
Stress combinations—Reservoir design—Prestressed and conventional (**48**-34) Feb. 1952 505
Strestcrete
–Precast blocks (**48**-8) Oct. 1951 113
(**48**-9) Oct. 1951 125
Structural characteristics — Earthquake resistant design (**48**-2) Sept. 1951 5
Structural concrete—Curing (**48**-46) May 1952 701
Structures—Preliminary analysis (**48**-42) Apr. 1952 645
Studwall — Mortarless block construction (**48**-9) Oct. 1951 125
Sturrup, V. R.—Disc. Wave velocity in concrete (**48**-40) Part 2, Dec. 1952 636–1
Subgrade — Effect on dowels — Load carrying capacity (**48**-13) Oct. 1951 169
Sulfate resistance — Calcium chloride (**48**-36) Mar. 1952 537
Sulfur trioxide-bearing products — Cement pastes (**48**-7) Sept. 1951 77
Superposition — Design method (**48**-32) Feb. 1952 465
Surface area — Effect on air entrainment (**48**-15) Nov. 1951 205

T

Tanks
–Multistory — Construction (**48**-24) Jan. 1952 365
–Precast vacuum processed (**48**-38) Mar. 1952 581
Temperature control — Durability (**48**-47) May 1952 725
Temperature differential—Curing (**48**-46) May 1952 701
Temperature — Effect on air entrainment (**48**-15) Nov. 1951 205
Tensile stress distribution—Measurement (**48**-17) Nov. 1951 225
Test procedure — Diagonal tension (**48**-11) Oct. 1951 145
Test specimens — Diagonal tension (**48**-11) Oct. 1951 145
Testing — Nondestructive (**48**-40) Apr. 1952 613
Tests
–Aggregates — Thermal coefficients of expansion (**48**-44) Apr. 1952 661
–Bond and tensile stress (**48**-17) Nov. 1951 225

–Impact and bending — Vacuum processed bracing (48-21) Dec. 1951 309
–Ultimate strength (48-54) June 1952 833
–Waterproofing paints (48-47) May 1952 ... 725
–Welded wire fabric—Bond (48-45) Apr. 1952 681
Thermal coefficients of expansion
–Aggregates (48-44) Apr. 1952 661
–Determination (48-33) Feb. 1952 485
Thermal expansion of aggregates and concrete durability (48-33)
–Edwin J. Callan Feb. 1952 485
–Disc. D. L. Bloem, Stanton Walker, R. E. Glover, T. F. Willis, F. V. Reagel and Author Part 2, Dec. 1952 504–1
Thermal stresses — Aggregates (48-33) Feb. 1952 485
Thomson, Harry F.—Exciting adventures (48-39) Apr. 1952 609
Tilt-up construction costs (48-14) F. Thomas Collins and Earl M. Bennetsen Nov. 1951 197
Tilt-up construction in western United States (48-10)
–F. Thomas Collins Oct. 1951 133
–Disc. Samuel Hobbs and Author Part 2, Dec. 1952 144–1
Time of set
–Calcium chloride (48-36) Mar. 1952 537
–Cement—Variation of electrical resistance (48-35) Mar. 1952 525
Timms, A. F.—Curing of concrete—Introduction (48-46) May 1952 701
Tuthill, Lewis H.
–Durable concrete in hydraulic structures (48-47) May 1952 740
–Insulation for protection of new concrete in winter (48-18) Nov. 1951 253
–Disc. Slip-forms for concrete canal lining (48-41) Part 2, Dec. 1952 644–1
Tunnel lining
–Cracks (LR 48-10) Oct. 1951 185
(LR 48-10) Jan. 1952 425
Turbogenerator — Foundation design (48-16) Nov. 1951 213

U

Ultimate load design
–(48-55) June 1952 865
–Equations (48-53) June 1952 809
–Introduction (48-51) June 1952 797
–Universal application (48-52) June 1952 .. 801
Ultimate strength — Research review (48-54) June 1952 833
Use of Chicago fly ash in reducing cement-aggregate reaction (48-31) C. H. Scholer and G. M. Smith Feb. 1952 457
Utility poles — Precast vacuum processed (48-38) Mar. 1952 581

V

Vacuum concrete — Applications (48-38) Mar. 1952 581
Vacuum process—Bracing (48-21) Dec. 1951 309
Vibration
–Pavement concrete (LR 48-21) Feb. 1952 . 514
–Turbine foundations (48-16) Nov. 1951 213
Vollmer, H. C.
–General review of curing methods (48-46) May 1952 721
–Disc. Calcium chloride in concrete (48-36) Part 2, Dec. 1952 560–1
Volume change — Concrete — Calcium chloride (48-36) Mar. 1952 537

W

Walker, Stanton
–Effects of temperature changes on concrete as influenced by aggregates (48-44) Apr. 1952 661
–Disc. Thermal expansion of aggregates and concrete durability (48-33) Part 2, Dec. 1952 504–1
Wall footings—Optimum dimensions (48-23) Dec. 1951 333
Water-cement ratio—Durability (48-47) May 1952 725
Water content—Pumice concrete (LR 48-20) Feb. 1952 514
Waterproofing paints — Tests (48-47) May 1952 725
Waterr E. H.—Disc. New techniques in the study of setting and hardening of hydraulic materials (48-35) Part 2, Dec. 1952 536–1
Wave velocity apparatus — Concrete testing (48-40) Apr. 1952 613
Wave velocity in concrete (48-40)
–Johannes Andersen and Poul Nerenst Apr. 1952 613
–Disc. R. Jones, J. R. Leslie, V. R. Sturrup and Authors Part 2, Dec. 1952 636–1
Weight comparison—Lightweight concrete (48-4) Sept. 1951 37
Welded wire fabric—Bond properties (48-45) Apr. 1952 681
Wenger, E. C.—Disc. Slip-forms for concrete canal lining (48-41) Part 2, Dec. 1952 . 644–1
Whitney, Charles S.—Comprehensive numerical method for the analysis of earthquake resistant structures (48-2) Sept. 1951 5
Why design by ultimate strength theories? (48-52)
–Boyd G. Anderson June 1952 801
–Disc. John I. Parcel June 1952 806
Why small [illegible] frequently get poor concrete (48-[illegible]) A. W. Brust Jan. 1952 .. 417
Wilde, Robert E.—Automatic jacks speed sliding-form construction (48-26) Jan. 1952 381
Williams, G. M.—Disc. Calcium chloride in concrete (48-36) Part 2, Dec. 1952 560–1
Willis, T. F.—Disc. Thermal expansion of aggregates and concrete durability (48-33) Part 2, Dec. 1952 504–1
Wind load factors—Ultimate design (48-56) June 1952 881
Winter concreting
–Electrical heating (48-48) May 1952 753
–Insulation (48-18) Nov. 1951 253
Woodford, T. V. D.—Slip-forms for concrete canal lining (48-41) Apr. 1952 637

INDEX

Current Reviews

From JOURNAL OF AMERICAN CONCRETE INSTITUTE, V. 23, Sept. 1951 to June 1952

A

Abrasive resistance of pavement increased by the use of vacuum concrete. Leviant and De La Sayette. *La Technique Moderne-Construction*... 278

Abutments for small highway bridges—Part I. Feld. *Proceedings, Highway Research Board*.... 522

Acoustic testing of concrete. Kreyger. *Cement*.. 909

Admixtures — Air-entraining — Tests. *Technical Memorandum, Waterways Experiment Station*... 906

Aerated concrete. *Civil Engineering and Public Works Review*..... 278

Aerated concrete—Part 2. *Digest, Building Research Station*..... 106

Aggregate — Density measurement. Destable. *Annales de L'Institut Technique du Batiment et des Travaux Publics*..... 794

Aggregate—Siliceous—Fire resistance. Mitchell. *Building Materials and Structures Report, National Bureau of Standards*..... 432

Aggregate—Testing. Smith. *Proceedings, Institution of Civil Engineers*..... 907

Aggregate—Test for impurities. Mather. *ASTM Bulletin*..... 521

Aggregate grading — Optimum. Plum. *Building Research Studies, Danish National Institute of Building Research*..... 910

Aggregates—Dam construction. Pittman. *Civil Engineering*..... 795

Aggregates—Freeze-thaw tests. Timms. *Public Roads*..... 436

Aggregates—Grading. Mercer. *Law of Grading for Concrete Aggregates*..... 360

Aggregates—Limerock. Bugg and Firmage. *Proceedings, Highway Research Board*..... 694

Aggregates—Petrographic examination. Mather and Mather. *ASTM Proceedings*..... 522

Aggregates — Specifications. White. *Civil Engineering*..... 696

Air bubble size—Aerated concrete. Lord and Willis. *ASTM Bulletin*..... 433

Air content — Hardened concrete. Klein, Pirtz and Polivka. *ASTM Proceedings*..... 524

Air-entraining concrete. Valenta. *Publications of the Faculty of Civil Engineering, Czech Technical University*..... 358

Air-entraining concrete — Characteristics. Duriez. *Revue des Materiaux de Construction*..... 605

Air-entraining concrete in Switzerland. Frey. *Revue des Materiaux de Construction*..... 521

Air entrainment—Research review. Bosschart. *Cement*..... 796

Airfield—Layout and design. Seelye. *Data Book for Engineers*..... 906

Airfields—Frost action. Johnson. *Special Report, Highway Research Board*..... 905

All concrete warehouse with prestressed concrete roof domes. *La Technique Moderne-Construction* 910

American building industry, The. *Reinforced Concrete Review*..... 277

Amount of water in sand, The. Houlnick. *Annales des Ponts et Chaussees*..... 521

Analysis of a reinforced concrete structure with the aid of photoelasticity. Kuhn. *Der Bauingenieur*..... 279

Analysis of reinforced concrete rectangular and triangular flat plates restrained along their edges. Danusso. *Il Cemento*..... 190

Analysis of straight beams by means of Mohr's corollary. Berio. *Il Cemento*..... 108

Apparatus for measuring the water-cement ratio of concrete. *Concrete and Constructional Engineering*..... 695

Application of Cross' method for beams with variable section modulus. Obraczay. *Oesterreichische Bauzeitschrift*..... 431

Application of plastic theory to bending of centrally loaded columns. Szechy. *Magyar Kozlekedes Mely es Vizepites*..... 192

Applying basic engineering principles to concrete unit manufacturing. Loving. *Rock Products*.. 700

Approximate formulas for rectangular tanks. Craemer. *Oesterreichische Bauzeitschrift*..... 602

Arch bridge over the Imatra Falls, Finland. Ostenfeld and Jonson. *Betong*..... 278

Arches—High—Lateral loads. *Concrete and Constructional Engineering*..... 695

Arches — Redundant — Design. Catalano. *Giornale del Genio Civile*..... 189

Architecture—Contemporary. Michaels. *Contemporary Structure in Architecture*..... 112

Asbestos — Cement pipe — Soil effect. Denison and Romanoff. *Journal of Research*..... 602

Autogenous healing—Cement paste. Murata. *Journal of the Japan Society of Civil Engineers*.. 793

Auxiliary vibrator for hand and machine sieving. Hughes. *The Engineer*..... 359

Axial load—Reinforced members. Hognestad. *University of Illinois Engineering Experiment Station Bulletin*..... 434

B

Basic principles: Foundations of power hammers. Herrmann. *Schweizerische Bauzeitung*..... 359

Beam—Continuous—Design. Comiz. *Il Cemento* 429

Beam frame bridges for narrow roads. Cronholm and Monsted. *Betong*..... 190

Beams—Analysis. Berio. *Il Cemento*..... 108

Beams—Circular—Fixed-end moments. Amaral. *Revista da Ordem dos Engenheiros*..... 105

Beams—Composite—Flow and creep. Esslinger. *Der Bauingenieur*..... 905

Beams—Compound—Prestressed. Fritz. *Stahlbau* 908

Beams — Continuous — Bridges. Massonet. *Annales des Travaux Public de Belgique*..... 112

Beams — Continuous circular — Design. Amaral. *Revista da Ordem dos Engenheiros*..... 107

Beams — Deflection — Short-term loads. Blakey. *Magazine of Concrete Research*..... 357

Beams — Multiple — Bridges. Massonet. *International Assn. for Bridge and Structural Engineering*..... 110

Beams—Prestressed—Ultimate resistance. Abeles. *Concrete and Constructional Engineering*..... 603

Beams — Prestressed — Cross section. Fluxa. *Il Cemento*..... 358

Beams—Rectangular—T- —Design. Reese. *CRSI Design Handbook*..... 796

Beams—Strength in shear. Wilby. *Magazine of Concrete Research*..... 359

Beams — Trapezoidal — Design. Alesund. *Betong* 191

Beams — Variable section — Design. Obraczay. *Oesterreichische Bauzeitschrift*..... 431

Bending moments due to temperature changes in continuous reinforced concrete structures. Chronowicz. *Concrete and Constructional Engineering*..... 430

Bending — Reinforced members. Hognestad. *University of Illinois Engineering Experiment Station Bulletin*..... 434

Bibliography—Cement—Concrete. Slate. *Comprehensive Bibliography of Cement and Concrete—1925-47*..... 696

Block — Hollow — Hot air hardening. Kleinlogel. *Betonstein-Zeitung*..... 435

Bond of steel bars in concrete. Brice. *Annales de L'Institut Technique du Batiment et des Travaux Publics* ... 111
Box girders — Bridge construction. Stohr. *Beton- u. Stahlbetonbau* ... 434
Bridge—Combination. Stohr. *Beton- u. Stahlbetonbau* ... 434
Bridge—Construction methods. Krall. *Schweizer Archiv fur Angewan die Wissenschaft und Technik* 793
Bridge—Cracking—Core studies. Braun. *Der Bauingenieur* ... 194
Bridge—Flexible arch. Ostenfeld and Jonson. *Betong* ... 278
Bridge—Prestressed concrete. *Reinforced Concrete Review* ... 189
Bridge—Prestressed concrete. Rinaldi. *Giornale del Genio Civile* ... 106
Bridge—Prestressed concrete. Homberg, Kohling and Fuchs. *Der Bauingenieur* ... 193
Bridge—Prestressed rigid frame. Finsterwalder and Konig. *Der Bauingenieur* ... 522
Bridge—Reconstruction. *Deutscher Beton-Verein.* 196
Bridge—Reconstruction. Veit. *Der Bauingenieur* 193
Bridge slabs—Composite—Buckling. Dischinger. *Der Bauingenieur* ... 193
Bridges — Arch — Analysis. Priolo. *Giornale del Genio Civile* ... 191
Bridges—Beam frame. Cronholm and Monsted. *Betong* ... 190
Bridges—Load distribution. Fluxa. *Giornale del Genio Civile* ... 359
Bridges—Multiple beam. Massonet. *International Assn. for Bridge and Structural Engineering* ... 110
Bridges—Precast. McMinn. *Bulletin, Highway Research Board* ... 434
Bridges—Prestressed. Dumas. *Travaux* ... 906
Bridges—Prestressed. Moineau. *La Technique Moderne-Construction* ... 604
Bridges — Prestressed concrete. Kolm and Osterman. *Betong* ... 190
Bridges—Prestressed concrete. Hildeberg. *Betong* 192
Bridges — Prestressed — Multiple girder. Vandepitte. *Communication, International Congress on Prestressed Concrete* ... 795
Bridges—Scour around piers. *Research Report, Highway Research Board* ... 194
Bridges—Slab and beam. *University of Illinois Engineering Experiment Station Bulletin* ... 908
Bridges — Small — Abutments. Feld. *Proceedings, Highway Research Board* ... 522
Buckling of reinforced concrete roadway bridge slabs with tied steel beams and the influence of one sided heating of the composite bridge slabs. Dischinger. *Der Bauingenieur* ... 193
Buckling—Restrained columns. Habel. *Beton- u. Stahlbetonbau* ... 431
Building—American practice. *Reinforced Concrete Review* ... 277
Building — Reinforced concrete. *Informes y Memorias de la Sociedad de Ingenieros de Peru* .. 106
Buildings—Reinforced concrete. *Concrete and Constructional Engineering* ... 431
Bull Shoals Dam now completed. Pittman. *Civil Engineering* ... 795
Ball tests—Hardened concrete. Hoeffgen and Back. *Der Bauingenieur* ... 523

C

Cable eccentricity — Prestressed members. Kaufman. *Inzynieria i Budownictwo* ... 908
Caissons—Precast. White. *Proceedings, Institution of Civil Engineers* ... 905
Caissons—Wharf constructions. *Concrete and Constructional Engineering* ... 429
Calculation of air bubble size distribution from results of a Rosiwal traverse of aerated concrete. Lord and Willis. *ASTM Bulletin* ... 433
Cement—Accelerated hardening test. Waitzmann. *Stavebni prumysl* ... 192
Cement—Analysis. Becker. *Revue des Materiaux de Construction* ... 694
Cement—Bibliography. Slate. *Comprehensive Bibliography of Cement and Concrete—1925-47* ... 696
Cement—Bulk handling. *Concrete and Constructional Engineering* ... 601
Cement—Durability. Rockwood. *Rock Products* 111
Cement—Ferric. Ferrari. *Il Cemento* ... 189
Cement—French standards. Lafuma. *Annales de L'Institute Technique du Batiment et des Travaux Publics* ... 108
Cement—Hardening—Theory. Jaspers. *Revue des Materiaux de Construction* ... 694
Cement—Manufacturing plant. *Concrete and Constructional Engineering* ... 430
Cement — Manufacturing processes. Ferrari. *Il Cemento* ... 357
Cement—Mass concrete. Walz. *German Committee for Reinforced Concrete* ... 524
Cement—Performance in concrete. Verbeck and Foster. *ASTM Proceedings* ... 606
Cement—Pozzolanic. Ferrari. *Il Cemento* ... 189
Cement—Pozzolanic. Goria and Appiani. *Il Cemento* ... 111
Cement — Processing. Deforge. *Revue des Materiaux* ... 105
Cement—Specific surface. Jaspers. *Revue des Materiaux* ... 432
Cement — Specifications — American — French. de Langavant. *Revue des Materiaux de Construction* ... 523
Cement — Type — Performance. Jackson. *Proceedings ASTM* ... 698
Cement chemistry. Newkirk. *Journal of Research* 698
Cement paste—Autogenous healing. Murata. *Journal of the Japan Society of Civil Engineers* .. 793
Cement specimens — Length measurement. Beitlich. *Rock Products* ... 193
Cement-aggregate reaction—Effect of hydroxyl ions. Vivian. *Australian Journal of Applied Science* ... 429
Cement-aggregate reaction—Particle size effect. Vivian. *Australian Journal of Applied Science.* 794
Cement-aggregate reaction — Soda content — Cooling rate of clinker. Davis. *Australian Journal of Applied Science* ... 433
Cement-aggregate reaction—Temperature effect. Vivian. *Australian Journal of Applied Science* .. 431
Cementing agents for mass concrete: Investigations of hydraulic cementing agents of cement, lime and trass. Walz. German Committee for Reinforced Concrete ... 524
Changes in American cement specifications. de Langavant. *Revue des Materiaux de Construction* ... 523
Chimney—Foundation design. Mehmel. *Der Bauingenieur* ... 522
Cleaning and sealing joints in concrete roads. *Concrete and Constructional Engineering* ... 601
Clinker—Grinding and storage. Deforge. *Revue des Materiaux* ... 105
Clinker—Sulfate effect. Newkirk. *Journal of Research* ... 698
Coast protection works at Clacton. *Concrete and Constructional Engineering* ... 604
Code design—German. *Beton Kalender* ... 195
Columns—Buckling. Habel. *Beton- u. Stahlbetonbau* ... 431
Columns—Design. Reese ... 796
Columns—Eccentrically loaded. Szechy. *Magyar Kozlekedes Mely-es Vizepiten* ... 192
Columns — Eccentrically loaded — Ultimate strength. Cowan. *Magazine of Concrete Research* ... 357
Compaction of concrete slabs by surface vibration, The. First series of experiments. Kirkham and Whiffin. *Magazine of Concrete Research* ... 795
Compaction—Vibration. Davies. *Magazine of Concrete Research* ... 698
Complexometric analysis of iron, calcium and magnesium in cements and similar substances. Becker. *Revue des Materiaux de Construction* .. 694
Comments on "imaginative" cement and concrete chemistry. Rockwood. *Rock Products* ... 111
Composite action between precast reinforced concrete sections and cast-in-place concrete. Meyer. *Der Bauingenieur* ... 602
Composite girder — Prestressed. Homberg, Kohling and Fuchs. *Der Bauingenieur* ... 193
Comprehensive bibliography of cement and concrete —1925-47. Slate. Engineering Experiment Station, Purdue University ... 696
Compressed elements in prestressed concrete. Eimer. *Inzynieria i Budownictwo* ... 794
Compound beam with concrete plate prestressed by tie steel. Fritz. *Stahlbau* ... 908

Computation of floor beams and influence on the distribution of concentrated loads to girders in a reinforced concrete bridge. Fluxa. *Giornale del Genio Civile* ... 359
Concrete—air-entraining. L'Hermite. *Annales de L'Institut Technique du Batiment et des Travaux Publics* ... 109
Concrete — Sand-gravel — Volume changes. Jackson and Timms. *Public Roads* ... 109
Concrete—Thermal expansion. Bonnell and Harper. *National Building Studies* ... 194
Concrete almanac. Wilhelm Ernst & Sohn ... 195
Concrete beams of trapezoidal cross section. Alesund. *Betong* ... 191
Concrete casting in pressure shafts. *Teknisk Ukeblad* ... 189
Concrete cracking Part I—General characteristics. Mercer. *Commonwealth Engineer* ... 433
Concrete cracking Part 2—Pavement studies. Mercer. *Commonwealth Engineer* ... 522
Concrete cracking Part 3—Flow through hydraulic structures. Mercer. *Commonwealth Engineer* .. 697
Concrete mix design. Campus. *Cours de Constructions du Genie Civil, Universite de Liege* ... 522
Concrete roads repaired by application of a new surface course. Unger and Barentzen. *Cement.* 361
Concrete shell structures in the West. Thompson. *Architectural Record* ... 359
Concrete structures and corrosion. Griffiths. *Engineering* ... 694
Construction of a dock in Cheshire. *Concrete and Constructional Engineering* ... 694
Construction of a grain silo in Iraq. Pitt. *Reinforced Concrete Review* ... 190
Construction of a large jetty on Southampton water. *Concrete and Constructional Engineering* 603
Construction of a large sewage digester of 6100 cu m capacity in reinforced concrete. Kiesz. *Der Bauingenieur* ... 191
Construction with moving forms. Hunter. Concrete Publications, Ltd. ... 107
Construction of new buildings of the Belgian National Bank at Brussels. Van Goethem. *Annales de L'Institut Technique du Batiment et des Travaux Publics* ... 108
Construction of a prestressed concrete road at Crawley New Town. McIntosh and Mercer. *Proceedings, Institution of Civil Engineers* ... 908
Construction of reservoirs for hydro-carbons in reinforced concrete made tight by means of a hydraulic partition. Brice. *Le Genie Civil* 360
Construction of a road in prestressed concrete. *Civil Engineering and Public Works Review* 191
Construction practices on the double locks of the Lower Isar. Stocker. *Der Bauingenieur* 905
Contemporary structure in architecture. Michaels. Reinhold Publishing Corp. ... 112
Continuity—Beams. Fluxa. *Giornale del Genio Civile* ... 359
Continuous deep girder, The. Bay. *Beton- u. Stahlbetonbau* ... 694
Continuous structures—Influence lines. Griot. *Influence Line Tables* ... 906
Continuous structures—Influence lines. Michalos and Wilson. *Proceedings ASCE* ... 905
Continuous structures — Temperature effect. Chronowicz. *Concrete and Constructional Engineering* ... 430
Continuously reinforced pavements—Stanton. *Proceedings, Highway Research Board* ... 602
Contraction joints in concrete dams. Lefebyre. *La Technique Moderne-Construction* ... 909
Contractor assays the specifications for Bull Shoals Dam, A. White. *Civil Engineering* ... 696
Contribution to the calculation of foundations of tall chimneys. Mehmel. *Der Bauingenieur* ... 522
Contribution to design of bridge floors with multiple beams. Massonet. *Annales des Travaux Public de Belgique* ... 112
Core boring on the roadway deck of the Cologne-Deutz bridge over the Rhine. Braun. *Der Bauingenieur* ... 194
Corrosion—Concrete structures. Griffiths. *Engineering* ... 694
Cost—Prestressed concrete. McIntosh and Mercer. *Proceedings, Institution of Civil Engineers* ... 908
Costs—Structures. Seelye. *Data Book for Engineers* ... 905
Crack-sealing materials. *Bibliography, Highway Research Board* ... 694
Cracking — Causes — Remedies. Mercer. *Commonwealth Engineer* ... 433
Cracking — Hydraulic structures. Mercer. *Commonwealth Engineer* ... 697
Cracking—Pavement. Mercer. *Commonwealth Engineer* ... 522
Creep — Composite beams. Esslinger. *Der Bauingenieur* ... 905
Creep—Concrete. Friedrich. *Oesterreicheische Bauzeitschrift* ... 277
Creep—Laws. Freyssinet. *Magazine of Concrete Research* ... 696
Cross sections of prestressed beams obtained by direct methods. Fluxa. *Il Cemento* ... 358
CRSI design handbook. Reese. Concrete Reinforcing Steel Institute ... 796
Curing—Low-pressure steam. Saul. *Cement and Lime Manufacture* ... 191
Curing—Prestressed members. Hubert. *Communication, International Congress on Prestressed Concrete* ... 794

D

Dam—Foundation treatment. Simonds. *Proceedings, ASCE* ... 523
Damage to civil engineer structures caused by the Imaichi earthquake. Okamoto and Kubo. *Transactions, The Japan Society of Civil Engineers* ... 693
Dampproofing. *Paint Manual* ... 694
Dams — Arch — Design — Model tests. Tschech and Jaburek. *Oesterreichische Bauzeitschrift* 524
Dams—construction. Stocker. *Der Bauingenieur* 905
Dams—Contraction joints. Lefebyre. *La Technique Moderne-Construction* ... 909
Dams—Earthfill. Mallet and Pacquant. *Earthfill Dams* ... 699
Data book for engineers V. I—Design. V. II—Specifications and cost. Seelye. John Wiley & Sons, Inc. ... 905
Deflections in gridworks and slabs. Ewell, Okubo and Abrams. *Proceedings, ASCE* ... 358
Deflections in slabs on elastic foundations. Ewell and Okubo. *Proceedings, Highway Research Board* ... 906
Deformation of concrete, The. Freyssinet. *Magazine of Concrete Research* ... 696
Design—Application of elasticity. Torroja. *Elementary Lessons in Elasticity with Applications in Structural Design* ... 359
Design—Chimney foundation. Mehmel. *Der Bauingenieur* ... 522
Design—Continuous girder. Bay. *Beton- u. Stahlbetonbau* ... 694
Design—Flat slab. Danusso. *Il Cemento* ... 357
Design—High arches. *Concrete and Constructional Engineering* ... 695
Design — Multiple-beam bridges. Massonet. *Annales des Travaux Public de Belgique* ... 112
Design—Prestressed beam. Fritz. *Stahlbau* 908
Design—Prestressed beams. Fluxa. *Il Cemento.* 358
Design—Reinforced concrete. Reese. *CRSI Design Handbook* ... 796
Design — Rigid frames. Dall'Aglio. *Giornale del Genio Civile* ... 105
Design—Rigid frame formulas. Kleinlogel. *Rigid Frame Formulas* ... 793
Design—Trapezoidal beams. Alesund. *Betong* .. 191
Design and construction of the new deep-water quays at Leith. White. *Proceedings, Institution of Civil Engineers* ... 905
Design of arch dams compared with the results of structural model tests. Tschech and Jaburek. *Oesterreichische Bauzeitschrift* ... 524
Design of bridge floors with multiple beams and their torsional resistance. Massonet. *Internat'l Assn. for Bridge and Structural Engineering* 110
Design of concrete mixes. Weiner. *Publications, Faculty of Civil Engineering, Czech Technical University* ... 189
Design of two-way reinforced concrete slabs by the theory of plasticity. Craemer. *Oesterreichische Bauzeitschrift* ... 697
Designing for nuclear shielding. Glen. *Civil Engineering* ... 696

Digester—Sewage. Kiess. *Der Bauingenieur*.... 191
Discussion and clarification on ferric and pozzolanic materials. Ferrari. *Il Cemento*..... 189
Dock—Construction. *Concrete and Constructional Engineering*..... 694
Domes—Prestressed. *La Technique Moderne-Construction*..... 910
Donau bridge at the Ganstor in Ulm. Finsterwalder and Konig. *Der Bauingenieur*..... 522
Durability—Temperature and moisture effect. Meyers. *Rock Products*..... 360
Durability—Weathering effect. Campus. *Cours de Constructions du Genie Civil, Universite de Liege*..... 604
Durability of concrete with and without reinforcement subjected to weathering. Campus. *Cours de Constructions du Genie Civil,, Universite de Liege*..... 604
Dynamic modulus—Determination. Kreyger. *Cement*..... 909
Dynamic testing—Pulse techniques. Leslie. *Proceedings, ASTM*..... 793

E

Earthfill dams. Mallet and Pacquant. Eyrelles.. 699
Earthquake damage — Japanese structures. Okamoto and Kubo. *Transactions, Japan Society of Civil Engineers*..... 693
Earthquake—Lateral forces. *Proceedings, ASCE*. 106
Economy — Prestressed concrete. Schultz. *Rakennusinsinoori*..... 905
Effect of exposure to soils on the properties of asbestos-cement pipe. Denison and Romanoff. *Journal of Research*..... 602
Effect of mortar saturation in concrete freezing and thawing tests. Whiteside and Sweet. *Proceedings, Highway Research Board*..... 697
Effect of SO_3 on the alkali compounds of portland cement clinker. Newkirk. *Journal of Research* 698
Elasticity—Elementary. Torroja. *Elementary Lessons in Elasticity with Applications in Structural Design*..... 359
Elementary lessons in elasticity with applications in structural design. Torroja. Editorial Doesat.. 359
Engineer develops skyhooks for industrial buildings, An. *Cleveland Engineering*..... 522
Experiences with nondestructive testing of concrete with ball-test apparatus. Hoeffgen and Back. *Der Bauingenieur*..... 523
Exploratory tests to develop a method for determining the air content of hardened concrete. Klein, Pirtz and Polivka. *ASTM Proceedings*. 524
Extreme loading cases for multistory frames. Lamberg. *Beton- u. Stahlbetonbau*..... 278

F

Factor of safety as applied to reinforced concrete design, The. Carroll. *Journal, Institution of Civil Engineers*..... 695
Final foundation treatment at Hoover Dam. Simonds. *Proceedings, ASCE*..... 523
Fire resistant construction—Warehouse. *La Technique Moderne-Construction*..... 910
Fire tests of steel columns protected with siliceous aggregate concrete. Mitchell. *Building Materials and Structures Report, NBS*..... 432
First centennial of reinforced concrete, The. Neuman. *Il Cemento*..... 434
First conference on concrete and other applications of portland cement. *Comite Permanente de las Conferencias del Hormigon*..... 606
Flat plate—Analysis. Neuman. *Il Cemento*..... 434
Flat slab design. Danusso. *Il Cemento*..... 357
Flexible mould stop for long line prestressed concrete. Clarke. *Civil Engineering and Public Works Review*..... 107
Floor beams—Bridges—Computation. Fluxa. *Giornale del Genio Civile*..... 359
Floor elements in prestressed concrete. Bourges-Manoury. *Communication, International Congress on Prestressed Concrete*..... 695
Floors — Marginal girders — Stiffness. Sager. *Beton- u. Stahlbetonbau*..... 277
Flow and creep in composite beams. Esslinger. *Der Bauingenieur*..... 905
Fly ash—Pozzolan. Muntand and Munro. *Journal of the Institution of Engineers Australia* 279
Foamed concrete. *Digest, Building Research Station*..... 106
Foamed concrete. *Cement och Betong*..... 195
Foamed concrete. *Civil Engineering and Public Works Review*..... 278
Foamed concrete. Levy. *Revue des Materiaux*... 279
Foaming agents — Aluminum —Zinc — Calcium carbide — Calcium oxychloride. Levy. *Revue des Materiaux*..... 280
Footings—Safe loads. Reese. *CRSI Design Handbook*..... 796
Form pressure—Fresh concrete. Guerrin. *Cement* 280
Forms—Arched bridge. Krall. *Schweizer Archiv fur Angewan die Wissenschaft und Technik*..... 793
Forms — Dome construction. *La Technique Moderne-Construction*..... 910
Forms—Moving. Hunter. *Construction with Moving Forms*..... 107
Foundation—Franki pile. Zaborowski. *Civil Engineering*..... 604
Foundation — Restricted site. McMahon. *Civil Engineering*..... 907
Foundation treatment—Hoover Dam. Simonds. *Proceedings, ASCE*..... 523
Foundations — Centrifuge. Bagdoyan. *Civil Engineering*..... 699
Foundations—Grouting. Bernatzik. *Der Bauingenieur*..... 192
Foundations—Hinged—Prestressed. VanGoethem. *Annales de L'Institut Technique du Batiment et des Travaux Publics*..... 108
Foundations — Power hammers. Herrmann. *Schweizerische Bauzeitung*..... 359
Foundations—Tall chimneys. Mehmel. *Der Bauingenieur*..... 522
Frame — Building. *Concrete and Constructional Engineering*..... 693
Frames—Multistory—Extreme loading. Lamberg. *Beton-u. Stahlbetonbau*..... 278
Freeze-thaw tests — Mortar saturation effects. Whiteside and Sweet. *Proceedings, Highway Research Board*..... 697
Freezing and thawing tests of concrete containing Oregon and Washington aggregates. Timms. *Public Roads*..... 436
Frost action in roads and airfields. Johnson. Highway Research Board..... 905
Furnaces—Industrial. Trinks. *Industrial Furnaces*..... 693
Further notes on the principles and design of prestressed concrete. Abeles. *Civil Engineering and Public Works Review*..... 362

G

Gap grading. Duries. *Revue des Materiaux de Construction*..... 605
Gap grading. Mercer. *Law of Grading for Concrete Aggregates*..... 360
Gap grading—Aggregate. Plum. *Danish National Institute of Building Research*..... 910
Garage—Design and construction. McMahon. *Civil Engineering*..... 907
Gas concrete. Levy. *Revue des Materiaux*..... 280
Generalization of the Hardy Cross method—Application to continuous beams. Amaral. *Revista da Ordem dos Engenheiros*..... 107
Girder — Composite — Prestressed. Homberg, Kohling and Fuchs. *Der Bauingenieur*..... 193
Girder — Continuous — Design. Bay. *Beton- u. Stahlbetonbau*..... 694
Girder — Multihinged. Becker. *Beton- u. Stahlbetonbau*..... 106
Girders — Marginal — Torsional stiffness. Sager. *Beton- u. Stahlbetonbau*..... 277
Glen Affric hydro-electric works—II, The. *Concrete and Constructional Engineering*..... 103
Grading — Aggregate. Plum. *Danish National Institute of Building Research*..... 910
Gravel compaction and testing, and concrete mix design at London Airport. Smith. *Proceedings, Institution of Civil Engineers*..... 907
Grid system—Slab analysis. Ewell, and Okubo. *Proceedings, Highway Research Board*..... 906
Gridwork—Deflection. Ewell, Okubo and Abrams. *Proceedings, ASCE*..... 358

Grinding, sieving and storage of hydraulic products. Deforge. *Revue des Materiaux*. 105
Grouting—Settlement correction. Bernatzik. *Der Bauingenieur*. 192

H

Hardening — Cement — Accelerated test. Waitzmann. *Stavební prumysl*. 192
Heat—Effect on composite slabs. Dischinger. *Der Bauingenieur*. 193
Heat of hydration — Cement — Long-time study. Verbeck and Foster. *ASTM Proceedings*. 606
Heat treated concrete. Clarkson. *Engineering*. . 695
Hinged systems — Solution. Fuxa. *Il Cemento*. . 277
Hipped-plate construction — Small building. *Cleveland Engineering*. 522
Hot air hardening of precast concrete parts, especially of hollow blocks. Kleinlogel. *Betonstein-Zeitung*. 435
Houses—Prefabricated concrete. *Il Cemento*. 429
How temperature and moisture changes may affect the durability of concrete. Meyers. *Rock Products*. 360
Hydraulic structures — Permeability — Cracking. Mercer. *Commonwealth Engineer*. 697

I

Importance of the steel quality in reinforced concrete construction. Neumann. *Il Cemento*. 358
Industrial Furnaces, V. 1. Trinks. John Wiley & Sons, Inc. 693
Industrialized construction. *Il Cemento*. 429
Influence line tables. Griot. Frederick Ungar Publishing Co. 906
Influence lines — Elastic arches. Catalano. *Giornale del Genio Civile*. 189
Influence lines by corrections to an assumed shape. Michalos and Wilson. *Proceedings, ASCE*. . . . 905
Influence lines computation for redundant elastic arches. Catalano. *Giornale del Genio Civile*. . . . 189
Influence of high temperatures on prestressed concrete. Baar. *Communication, International Congress on Prestressed Concrete*. 605
Investigation of the suitability of Prepakt concrete for mass and reinforced concrete structures. *Technical Memorandum, Waterways Experiment Station*. 697
Is scepticism towards air entrainment justified? Bosschart. *Cement*. 796
Iterative procedure for the solution of a continuous beam fixed at its supports. Comis. *Il Cemento* 429

J

Jetty—Construction features. *Concrete and Constructional Engineering*. 603
Joint, crack and undersealing materials. Bibliography, Highway Research Board. 694
Joints — Contraction — Sawed. Arndt. *Proceedings, Highway Research Board*. 794
Joints—Maintenance. *Concrete and Constructional Engineering*. 601

K

Kansas experience with concrete saw for cutting contraction joints in concrete pavements. Arndt. *Proceedings, Highway Research Board*. . 794
Knowledge gained by L.F.E.M. on graded sands for standard test. Voellmy and Rimathe. *Bulletin de la Reunion des Laboratories d'Essais et de Recherches sur les Materiaux et les Constructions*. 433

L

Large jetty on Southampton water, A. *Concrete and Constructional Engineering*. 429
Large reservoir designed for mining subsidence. *Concrete and Constructional Engineering*. 699
Lateral forces of earthquake and wind. *Proceedings, ASCE*. 106
Latest developments in the design and construction of prestressed concrete sleepers. Worontzoff. *Communication, International Congress on Prestressed Concrete*. 523
Law of cement hardening as a function of time, The. Jaspers. *Revue des Materiaux de Construction*. 694
Law of grading for concrete aggregates, The. Mercer. Melbourne Technical College Press. 360
Laws controlling relations between specific surface and the technological properties of cement. Jaspers. *Revue des Materiaux*. 432
Lifting of the Autobahn bridge over the Saalach River near Bad Reichenhall, The. Veit. *Der Bauingenieur*. 193
Lifting procedures with pressure injections of cement grout. Bernatzik. *Der Bauingenieur*. . 192
Lightened concrete, Part I. Levy. *Revue des Materiaux*. 279
Lightened concrete, Part II. Levy. *Revue des Materiaux*. 280
Lightened concretes—III and IV. *Revue des Materiaux*. 430
Lighthouse — Prestressed concrete. *Concrete and Constructional Engineering*. 430
Lightweight concrete. *Deutscher Beton-Verein*. . . 196
Lightweight concrete — Mix design. Duriez. *Revue des Materiaux de Construction*. 605
Lightweight concrete. *Civil Engineering and Public Works Review*. 278
Lightweight concrete. Levy. *Revue des Materiaux* 279
Lightweight concrete—Wood fiber. Levy.. *Revue des Materiaux*. 430
Lime—Mass concrete. Walz. German Committee for Reinforced Concrete. 524
Limerock concrete — Properties. Burg and Firmage. *Proceedings, Highway Research Board* 694
Linings — Tank — Rubber — Brick — Resin. Griffiths. *Engineering*. 694
Load carrying problems in reinforced concrete construction. Habel. *Beton- u. Stahlbetonbau*. 431
Long-time study of cement performance in concrete. Chapter 6—The heats of hydration of the cements. Verbeck and Foster. *ASTM Proceedings*. 606
Los Angeles constructs 2000-car underground garage. McMahon. *Civil Engineering*. 907
Low-pressure steam-curing. Saul. *Cement and Lime Manufacture*. 191

M

Manufacture of slag-cement by the wet process. Mary. *Annales de L'Institut Technique du Batiment et des Travaux Publics*. 430
Masonry units—Manufacture. Loving. *Rock Products*. 700
Masonry units—Slag concrete. *Slag Concrete Masonry Units*. 521
Mass concrete—Cementing agents. Walz. German Committee for Reinforced Concrete. 524
Mass concrete — Dynamic testing. Leslie. *Proceedings, ASTM*. 793
Mass concrete—Mix proportions. Pittman. *Civil Engineering*. 795
Mass concrete—Prepakt. *Technical Memorandum, Waterways Experiment Station*. 697
Maximum span lengths for highway deck bridges with multiple simply supported prestressed concrete girders. Vandepitte. *Communication, International Congress on Prestressed Concrete*. . . 795
Measure of the apparent density of an aggregate. Destable. *Annales de L'Institut Technique du Batiment et des Travaux Publics*. 794
Measurement of cement specimen lengths. Beitlich. *Rock Products*. 193
Measuring the prestress in steel wires in concrete with a wire stress meter. Jung and Kretschmer. *Betonstein-Zeitung*. 601
Mechanics—Elementary. Parker. *Simplified Mechanics and Strength of Materials*. 190
Melan system — Arched bridge. Krall. *Schweizer Archiv fur Angewan die Wissenschaft und Technik*. 793

Method of petrographic examination of aggregates for concrete. Mather and Mather. *ASTM Proceedings* 522
Mixes—Design. Weiner. *Publications, Faculty of Civil Engineering, Czech Technical University.* 189
Mixes — Special. Duriez. *Revue des Materiaux de Construction* 605
Mixes — Stable. Bergstrom. *Betong* 190
Mixes — Tilting drum — Tests. Joissel. *Annales de L'Institut Technique du Batiment et des Travaux Publics* 796
Mix design. Campus. *Cours de Constructions du Genie Civil, Universite de Liege* 522
Mix design — Pavement. Smith. *Proceedings, Institution of Civil Engineers* 907
Model tests — Arch dam. Tschech and Jaburek. *Oesterreichische Bauzeitschrift* 524
Moments at fixed ends of circular beams. Amaral. *Revista da Ordem dos Engenheiros* 105
Multiple-story buildings with precast walls at London Airport. *Concrete and Constructional Engineering* 430

N

New building of the Peruvian Telephone Co. in Lima, A. *Informes y Memorias de la Sociedad de Ingenieros de Peru* 106
New canal harbor bridge in Heilbronn, The. Stohr. *Beton- u. Stahlbetonbau* 434
New cement works at Shoreham. *Concrete and Constructional Engineering* 430
New Herdecke bridge over the Ruhr, a continuous composite girder bridge with prestress. Homberg, Kohling and Fuchs. *Der Bauingenieur* 193
New method for accelerated testing of cement hardening. Wattzmann. *Stavebni prumsyl* 192
New method for the solution of three-point problems. Fuxa. *Il Cemento* 277
New method of prestressing reinforced concrete bridges. Moineau. *La Technique Moderne-Construction* 604
New methods for treatment of concrete. L'Hermite. *Annales de L'Institut Technique du Batiment et des Travaux Publics* 109
New mixture for cement—Sulpho-aluminous-pozzolanic cement. Goria and Appiani. *Il Cemento* 111
New prestressed reinforced concrete bridge over Salmoggia River. Rinaldi. *Giornale del Genio Civile* 106
New shell construction using Zeiss-Dywidag system. Eulitz. *Beton- u. Stahlbetonbau* 524
New theory of reinforced concrete in the plastic range. Saliger. F. Deuticke Verlag 106
New ways in building concrete roads. Forschungsgeselschaft für das Strassenwesen e.V. 108
NF-VP control of cements at the mills within the framework of the French Standards. Lafuma. *Annales de L'Institut Technique du Batiment et des Travaux Publics* 108
Nine-story office building in London. *Concrete and Constructional Engineering* 693
Nomography and empirical equations. Johnson. John Wiley & Sons, Inc. 696
Nondestructive testing — Ball-type apparatus. Hoefigen and Back. *Der Bauingenieur* 523
Nondestructive testing of concrete. Jones. *Reinforced Concrete Review* 431
Nondestructive tests. Kreyger. *Cement* 909
Nuclear shielding—Design. Glen. *Civil Engineering* 696

O

Oceanographic instrument aids bridge engineers in pouring underwater concrete. Burt and Pritchard. *Civil Engineering* 695
Old street car tracks revived for traffic use in novel way. Bos. *Cement* 110
On the autogenous healing of cement paste. Murata. *Journal of the Japan Society of Civil Engineers* 793
On new construction methods in bridge building. Krall. *Schweizer Archiv fur Angewan die Wissenschaft und Technik* 793

P

Paint manual. U. S. Bureau of Reclamation 694
Pavement—Abrasion resistant. Leviant and De La Sayette. *La Technique Moderne-Construction* 278
Pavement—Concrete resurfacing. Lewis. *Proceedings, Highway Research Board* 793
Pavement—Cracking causes. Mercer. *Commonwealth Engineer* 522
Pavement—Prestressed. *Civil Engineering and Public Works Review* 191
Pavement—Prestressed. McIntosh and Mercer. *Proceedings, Institution of Civil Engineers* 908
Pavements—Continuous reinforcement. Stanton. *Proceedings, Highway Research Board* 602
Pavements — Joints — Cleaning — Filling. *Concrete and Constructional Engineering* 601
Performance of concrete resurfacing in Indiana. *Proceedings, Highway Research Board* 793
Photoelastic analysis—Stress distribution. Herr and Vandegrift. *Proceedings, Highway Research Board* 907
Photoelasticity—Structural analysis. Kuhn. *Der Bauingenieur* 279
Piers—Reinforced concrete pipe. *Concrete and Constructional Engineering* 432
Piles — Concrete. *Concrete and Constructional Engineering* 432
Piles—Laterally loaded—Tests. Raymondi. *Giornale del Genio Civile* 358
Piles—Manufacture. Loving. *Rock Products* 700
Piles—Reinforced concrete. *Concrete and Constructional Engineering* 429
Piles—Stadium foundation. Zaborowski. *Civil Engineering* 604
Piles — Tension — Extraction tests. Wakefield. *Engineering* 601
Pipe — Asbestos-cement — Soil effect. Denison and Romanoff. *Journal of Research* 602
Pipe—Manufacture. Loving. *Rock Products* 700
Pile foundations. Chellis .McGraw-Hill Book Co. 795
Placing concrete during frost. Bohm and Drechsel. Wilhelm Ernst & Sohn 906
Plant for prestressed concrete. *Reinforced Concrete Review* 189
Plastic flow — Prestressed concrete. Okada. *Journal of the Japan Society of Civil Engineers.* 793
Plastic theory—Columns. Szechy. *Magyar Kozlekedes Mely es Vizepites* 192
Plasticity—Reinforced concrete. Saliger. *New Theory of Reinforced Concrete in the Plastic Range* 106
Plates — Flat — Analysis. Danusso. *Il Cemento* 190
Plates — Theory. L'Hermite. *Annales de L'Institut Technique du Batiment et des Travaux Publics* 191
Portland cement paint. Bulletin, New Zealand Portland Cement Assn. 430
Power hammers — Foundations. Herrmann. *Schweizerische Bauzeitung* 359
Power plant—Penstock. Lindvik. *Teknisk Ukeblad* 189
Power plants—Scottish. *Concrete and Constructional Engineering* 109
Pozzolan — Sulfo-aluminous. Goria and Appiani. *Il Cemento* 111
Pozzolans. Ferrari. *Il Cemento* 189
Precast beams—Composite action. Meyer. *Der Bauingenieur* 602
Precast bridges and structures. McMinn. *Bulletin, Highway Research Board* 434
Precast caissons—Quay construction. White. *Proceedings, Institution of Civil Engineers* 905
Precast concrete. Michaels. *Contemporary Structure in Architecture* 112
Precast concrete. Rojot. *Cahiers du Centre Scientifique et Technique du Batiment* 430
Precast concrete—Hot air hardening. Kleinlogel. *Betonstein-Zeitung* 435
Precast concrete—School buildings. Dorain and Dorain. *Annales de L'Institut Technique du Batiment et des Travaux Publics* 357
Precast concrete North-Light roof trusses. *Concrete and Constructional Engineering* 429
Precast piles. Chellis. *Pile Foundations* 795
Precast units — Prestressed structures. Persons. *Rock Products* 435
Precast walls — Multistory buildings. *Concrete and Constructional Engineering* 430

Predetermination of water requirement and optimum grading of concrete. Plum. *Danish National Institute of Building Research*..... 910
Prepakt concrete. L'Hermite. *Annales de L'Institut Technique du Batiment et des Travaux Publics*..... 109
Prepakt concrete. *Technical Memorandum, Waterways Experiment Station*..... 697
Presan analysis—Flat slab. McMahon. *Civil Engineering*..... 907
Pressure of fresh concrete on forms. Guerrin. *Cement*..... 280
Prestress — Wires — Measurement. Jung and Kretschmer. *Betonstein-Zeitung*..... 601
Prestressed beams—Alloy bars. Ross. *Magazine of Concrete Research*..... 436
Prestressed beams—Design. Fluza. *Il Cemento*. 358
Prestressed beams—Ultimate resistance. Abeles. *Concrete and Constructional Engineering*..... 603
Prestressed bridges. Moineau. *La Technique Moderne-Construction*..... 604
Prestressed bridges — Construction. Dumas. *Travaux*..... 906
Prestressed compound beam. Fritz. *Stahlbau*... 908
Prestressed concrete. Michaels. *Contemporary Structure in Architecture*..... 112
Prestressed concrete. Guyon. *Annales de L'Institut Techniuge du Batiment et des Travaux Publics*..... 607
Prestressed concrete—End conditions—Loads. Eimer. *Inzynieria i Budownictwo*..... 794
Prestressed concrete—First U. S. Conference. *Proceedings*..... 693
Prestressed concrete—Foundations. Van Goethem. *Annales de L'Institut Technique du Batiment et des Travaux Publics*..... 108
Prestressed concrete—High temperature effect. Baar. *Communication, International Congress on Prestressed Concrete*..... 605
Prestressed concrete—Its future in the U. S. Spronk. *Contractors and Engineers Monthly*.... 521
Prestressed concrete — Origin. Neumann. *L'Industria Italiana del Cemento*..... 106
Prestressed concrete—Plant production. *Reinforced Concrete Review*..... 189
Prestressed concrete — Plastic flow — Shrinkage. Okada. *Journal of the Japan Society of Civil Engineers*..... 793
Prestressed concrete — Pre-tensioned — Long-line process. Clarke. *Civil Engineering and Public Works Review*..... 107
Prestressed concrete — Principles and design. Abeles. *Civil Engineering and Public Works Review*..... 362
Prestressed concrete — Roof. *Civil Engineering and Public Works Review*..... 105
Prestressed concrete — Stability problems. Kaufman. *Inzynieria i Budownictwo*..... 908
Prestressed concrete beams in the roof construction of the Kaukopaa cardboard mill. Schultz. *Rakennusinsinoori*..... 905
Prestressed concrete bridge—Composite girder. Homberg, Kohling and Fuchs. *Der Bauingenieur* 193
Prestressed concrete bridge. Rinaldi. *Giornale del Genio Civile*..... 106
Prestressed concrete bridges. *Deutscher Beton-Verein*..... 196
Prestressed concrete bridges. Hildeberg. *Betong*.. 192
Prestressed concrete bridges. Kolm and Osterman. *Betong*..... 190
Prestressed concrete domes. *La Technique Moderne-Construction*..... 910
Prestressed concrete footbridge. *Reinforced Concrete Review*..... 189
Prestressed concrete conference stresses precast units. Persons. *Rock Products*..... 435
Prestressed concrete in Central Africa. Hubert. *Communication, International Congress on Prestressed Concrete*..... 794
Prestressed concrete lighthouse, A. *Concrete and Constructional Engineering*..... 430
Prestressed concrete railroad ties. *La Technique Moderne-Construction*..... 110
Prestressed concrete tanks. Op Ten Noort. *Ingenieur*..... 794
Prestressed concrete ties — Design and construction. Worontzoff. *Communication, International Congress on Prestressed Concrete*..... 523
Prestressed concrete road. *Civil Engineering and Public Works Review*..... 191
Prestressed concrete warehouse of Edinburgh. *Concrete and Constructional Engineering*..... 105
Prestressed floor elements. Bourges-Manoury. *Communication, International Congress on Prestressed Concrete*..... 695
Prestressed members—Tests. *La Technique Moderne-Construction*..... 361
Prestressed pavement. McIntosh and Mercer. *Proceedings, Institution of Civil Engineers*..... 908
Prestressed pipes. Loving. *Rock Products*..... 700
Prestressed redundant structures — Design. Raineri. *Giornale del Genio Civile*..... 358
Prestressed rigid frame bridge. Finsterwalder and Konig. *Der Bauingenieur*..... 522
Prestressed spiral staircase. Mangel. *Civil Engineering*..... 603
Prestressed concrete tanks at Hartlepool. *Concrete and Constructional Engineering*..... 693
Prestressing — Effect on buckling. Habel. *Beton- u. Stahlbetonbau*..... 431
Principal development of a multi-hinged girder with tie rods. Becker. *Beton- u. Stahlbetonbau*. 106
Principles underlying the steam curing of concrete at atmospheric pressure. Saul. *Magazine of Concrete Research*..... 436
Problem of prestressing redundant structures. Raineri. *Giornale del Genio Civile*..... 358
Proceedings of the First U. S. Conference on Prestressed Concrete. Prestressed Concrete Conference, Massachusetts Institute of Technology 693
Proceedings of the German Concrete Institute. Deutscher Beton-Verein..... 196
Progress of construction of prestressed concrete bridges in Nord and Pas-de-Calais. Dumas. *Travaux*..... 906
Properties of plain and reinforced limerock concrete. Bugg and Firmage. *Proceedings, Highway Research Board*..... 694
Pull-out test, The. Osterman. *Betong*..... 190
Pulse techniques applied to dynamic testing. Leslie. *ASTM, Proceedings*..... 793
Pumped concrete—Research. Joisel. *Cahiers du Centre Scientifique et Technique du Batiment*.... 435

Q

Quays—Design and construction. White. *Proceedings, Institution of Civil Engineers*..... 905

R

Rails—Re-use as reinforcing. Bos. *Cement*..... 110
Raising roofs by hydraulic jacks lowers construction costs. Stewart. *Technical Bulletin, Housing and Home Finance Agency*..... 429
Rapid analysis for arch bridges. Priolo. *Giornale del Genio Civile*..... 191
Rational type of mushroom tank. Cervi. *Giornale del Genio Civile*..... 357
Recent developments in precasting concrete bridges and structures. McMinn. *Bulletin, Highway Research Board*..... 434
Reconstruction of a concrete road in Leicestershire. *Concrete and Constructional Engineering*..... 107
Redundant structures—Prestressed. Raineri. *Giornale del Genio Civile*..... 358
Reinforced concrete piles under tension. Wakefield. *Engineering*..... 601
Reinforced concrete slurry tanks. Faber. *Concrete and Constructional Engineering*..... 603
Reinforced concrete—A manual of standard practice. Concrete Reinforcing Steel Institute..... 523
Reinforced concrete — German practice. *Beton- u. Stahlbetonbau*..... 107
Reinforcement — Two-way slab. Neuman. *Il Cemento*..... 434
Reinforcing steel — Salvaged rails. Bos. *Cement*. 110
Remarks on the theory of plates and flat slabs. L'Hermite. *Annales de L'Institut Technique du Batiment et des Travaux Publics*..... 191
Reports on experiments with continuous reinforcement in concrete pavements — California. Stanton. *Proceedings, Highway Research Board*. 602
Research—Review. *Review of Current Research*.... 108
Research on pumped concrete. Joisel. *Cahiers du Centre Scientifique et Technique du Batiment*. 435

Research reports of the German Committee for Reinforced Concrete. Graf. Wilhelm Ernst & Sohn. 602
Reservoir — Foundation design. *Concrete and Constructional Engineering* 699
Residential flats in South London. *Concrete and Constructional Engineering* 431
Resistance of concrete to triaxial stresses. Chambaud. *Annales de L'Institut Technique du Batiment et des Travaux Publics* 106
Results of tests on prestressed concrete members. *La Technique Moderne-Construction* 361
Resurfacing — Concrete. Lewis. *Proceedings, Highway Research Board* 793
Retaining wall. *Concrete and Constructional Engineering* 433
Retaining walls—Safe loads. Reese. *CRSI Design Handbook* 796
Review of current research. Engineering College Research Council 108
Review of 75 years history of Wayss & Freytag AG. *Beton- u. Stahlbetonbau* 107
Revolutionary staircase built of prestressed concrete. Mangel. *Civil Engineering* 603
Rigid frame formulas. Kleinlogel. Frederick Ungar Publishing Co. 793
Rigid frames. Seelye. *Data Book for Engineers* 906
Rigid frames—Influence lines. Griot. *Influence Line Tables* 905
Rigid frames computed without equations. Dall'Aglio. *Giornale del Genio Civile* 105
Road—Reconstruction. *Concrete and Constructional Engineering* 107
Roads—Frost action. Johnson. *Special Report, Highway Research Board* 905
Roads—New methods. *Forschungsgesellschaft fur das Strassenwesen e.V.* 108
Roads—Repair by thin course. Unger and Barentzen. *Cement* 361
Roof in prestressed concrete. *Civil Engineering and Public Works Review* 105
Roof — Long-span — Pan forms. Reid. *Civil Engineering* 601
Roof slabs—Foamed concrete. *Cement och Betong* 195
Roofs—Jacked in place. Stewart. *Technical Bulletin, Housing and Home Finance Agency* 429
Rosiwal traverse—Bubble size determination. Lord and Willis. *ASTM Bulletin* 433

S

Safe load tables — Joists — Slabs — Columns. Reese. *CRSI Design Handbook* 796
Safety factor — Reinforced concrete. Campus and Torroja. *Annales de L'Institut Technique du Batiment et des Travaux Publics* 192
Sand—Grading. Voellmy and Rimathe. *Bulletin de la Reunion des Laboratories d'Essais et de Recherches sur les Materiaux et les Constructions* 433
Sand—Laboratory drying method. Houlnick. *Annales des Ponts et Chaussees* 521
Saw — Joint forming. Arndt. *Proceedings, Highway Research Board* 794
School buildings of "Les Sablons" at Saint-Pierre-des-Corps. Dorain and Dorain. *Annales de L'Institut Technique du Batiment et des Travaux Publics* 357
Scour around bridges. *Research Report, Highway Research Board* 194
Sea walls. *Concrete and Constructional Engineering* 604
Secondary stresses investigation at the bottom of an Intze-type reinforced concrete tank cylindrical wall. Contri. *Giornale del Genio Civile* 105
Sewage works — Concrete. Kiess. *Der Bauingenieur* 191
Shear connectors — Tests. Siess, Viest and Newmark. *Bulletin, University of Illinois, Engineering Experiment Station* 908
Shell construction — Z-D system. Eulitz. *Beton- u. Stahlbetonbau* 524
Shell—Dome construction. Michaels. *Contemporary Structure in Architecture* 112
Shell—Thin—Roof. *Proceedings, Deutscher Beton-Verein* 196
Shell structures. Thompson. *Architectural Record* 359
Shore protection. *Concrete and Constructional Engineering* 604
Shrinkage—Laws. Freyssinet. *Magazine of Concrete Research* 696
Shrinkage and creepage of concrete. Friedrich. *Oesterreichische Bauzeitschrift* 277
Shrinkage and plastic flow of prestressed concrete. Okada. *Journal of the Japan Society of Civil Engineers* 793
Silo construction. Pitt. *Reinforced Concrete Review* 190
Simplified mechanics and strength of materials. Parker. John Wiley & Sons, Inc. 190
Siporex—Foamed concrete. *Cement och Betong* 195
Skylights—Warehouse. *La Technique Moderne-Construction* 910
Slab — Haunched. McMahon. *Civil Engineering* 907
Slab supported on two sides, The. Olsen and Reinitzhuber. Wilhelm Ernst & Sohn 431
Slabs—Deflection. Ewell, Okubo and Abrams. *Proceedings, ASCE* 358
Slabs—Deflections. Ewell and Okubo. *Proceedings, Highway Research Board* 906
Slabs — Flat — Theory. L'Hermite. *Annales de L'Institute Technique du Batiment et des Travaux Publics* 191
Slabs—Foamed concrete. *Cement och Betong* 195
Slabs — Two-way — Design. Craemer. *Oesterreichische Bauzeitschrift* 697
Slag cement—Wet process. Mary. *Annales de L'Institut Technique du Batiment et des Travaux Publics* 430
Slag concrete masonry units. National Slag Assn. 521
Sliding forms. Hunter. Concrete Publications, Ltd. 107
Sliding forms—Dock construction. *Concrete and Constructional Engineering* 694
Sliding forms—Silo construction. Pitt. *Reinforced Concrete Review* 190
Some experiments on the compaction of concrete by vibration. Davies. *Magazine of Concrete Research* 698
Soniscope — Mass concrete tests. Leslie. *Proceedings, ASTM* 793
Span length—Prestressed bridge. Vandepitte. *Communication, International Congress on Prestressed Concrete* 795
Specifications—Dam construction. White. *Civil Engineering* 696
Spillways—Earth dams. Mallet and Pacquant. *Earthfill Dams* 699
Spiral staircase—Prestressed. Mangel. *Civil Engineering* 603
Spread footings. Seelye. *Data Book for Engineers* 906
Stability problems in prestressed concrete. Kaufman. *Inzynieria i Budownictwo* 908
Stadium — Shell roof. Zaborowski. *Civil Engineering* 604
Stable concrete mixes. Bergstrom. *Betong* 190
Staircase—Spiral—Prestressed concrete. Mangel. *Civil Engineering* 603
Standard manufacturing processes for the cement industry. Ferrari. *Il Cemento* 357
Standards — French — Cement. Lafuma. *Annales de L'Institute Technique du Batiment et des Travaux Publics* 108
Standards—German. *Beton Kalender* 195
Steam curing—Atmospheric pressure. Saul. *Magazine of Concrete Research* 436
Steam curing — High pressure — Atmospheric. Clarkson. *Engineering* 695
Steel — Alloy bars — Prestressed concrete. Ross. *Magazine of Concrete Research* 436
Steel quality — Importance. Neumann. *Il Cemento* 358
Steel-pan forms provide economical long-span roof. Reid. *Civil Engineering* 601
Strain gage for embedment in concrete. *NBS Technical News Bulletin* 277
Strain gages — Concrete tests. Grassam and Fisher. *Engineering* 607
Strain gages—Prestressed members. *La Technique Moderne-Construction* 361
Strength of materials. Parker. John Wiley & Sons, Inc. 190
Strength of reinforced concrete beams in shear. Wilby. *Magazine of Concrete Research* 359
Stress analysis — Techniques. Thompson. *Proc., Society for Experimental Stress Analysis* 432
Stress distribution — Photoelastic study. Herr and Vandegrift. *Proceedings, Highway Research Board* 907
Stresses—Secondary—Tanks. Contri. *Giornale del Genio Civile* 105

Structures — Precast. McMinn. *Bulletin, Highway Research Board* ... 434
Studies in cement-aggregate reaction XVI — The effect of hydroxyl ions on the reaction of opal. Vivian. *Australian Journal of Applied Science.* 429
Studies in cement-aggregate reaction XVII — Some effects of temperature on mortar expansion. Vivian. *Australian Journal of Applied Science* ... 431
Studies in cement-aggregate reaction XVIII— The effect of soda content and of cooling rate of portland cement clinker on its reaction with opal in mortar. Davis. *Australian Journal of Applied Science* ... 433
Studies in cement-aggregate reaction XIX— The effect on mortar expansion of the particle size of the reactive component in the aggregate. Vivian. *Australian Journal of Applied Science.* 794
Studies of compressive stress distribution in simply reinforced concrete near the point of failure. Herr and Vandegrift. *Proceedings, Highway Research Board* ... 907
Studies of slab and beam highway bridges. Part III — Small-scale tests of shear connectors and composite T-beams. Siess, Viest and Newmark. *University of Illinois Engineering Experiment Station Bulletin* ... 908
Study of combined bending and axial load in reinforced concrete members, A. Hognestad. *University of Illinois Engineering Experimen Station Bulletin* ... 434
Study of some special modern concrete mixes. Duriez. *Revue des Materiaux de Construction* ... 605
Subsidence — Foundation design. *Concrete and Constructional Engineering* ... 699
Substructure and oil store at electricity works. *Concrete and Constructional Engineering* ... 433
Suggested principles of low-pressure steam-curing of mortar and concrete. Saul. *Cement and Lime Manufacture* ... 191
Sulfate resistance — Fly ash concrete. Muntand and Munro. *Journal of the Institution of Engineers Australia* ... 279
Surfacing — Thin concrete. Unger and Barentzen. *Cement* ... 361
Swedish highway bridges in prestressed concrete. Kolm and Osterman. *Betong* ... 190
Swimming pools—Specifications. Seelye. *Data Book for Engineers* ... 906
Symposium on foam concrete. *Cement och Betong* 195

T

Tank — Mushroom type. Cervi. *Giornale del Genio Civile* ... 357
Tanks—Petroleum products. Brice. *Le Genie Civil* ... 360
Tanks — Prestressed concrete. Op Ten Noort. *Ingenieur* ... 794
Tanks — Prestressed concrete. *Concrete and Constructional Engineering* ... 693
Tanks — Rectangular — Approximate formulas. Craemer. *Oesterreichische Bauzeitschrift* ... 602
Tanks — Slurry — Design. Faber. *Concrete and Constructional Engineering* ... 603
Tanks—Stress determination. Contri. *Giornale del Genio Civile* ... 105
T-beam — Composite — Tests. Siess, Viest and Newmark. *University of Illinois Engineering Experiment Station Bulletin* ... 908
Techniques used in the experimental stress analysis of reinforced concrete structures. Thompson. *Proc., Society for Experimental Stress Analysis* ... 432
Temperature — Effect on bending moment. Chronowica. *Concrete and Constructional Engineering* ... 430
Temperature — High — Prestressed concrete. Baar. *Communication, International Congress on Prestressed Concrete* ... 605
Testing of tilting drum mixers. Joissel. *Annales de L'Institut Technique du Batiment et des Travaux Publics* ... 796
Tests of air-entraining admixtures. *Technical Memorandum, Waterways Experiment Station* ... 906
Tests of fine aggregate for organic impurities and compressive strength in mortars. Mather. *ASTM Bulletin* ... 521
Tests of prestressed concrete beams with alloy steel bars. Ross. *Magazine of Concrete Research* 436
Tests on concrete, with electrical resistance strain gauges. Grassam and Fisher. *Engineering* ... 607
Tests on laterally loaded piles. Raymondi. *Giornale del Genio Civile* ... 358
Theory of deflection of reinforced concrete beams under short-term loads, A. Blakey. *Magazine of Concrete Research* ... 357
Thermal expansion of concrete. Bonnell and Harper. *National Building Studies* ... 194
Thin-shell-arch hockey stadium for Quebec built in 10 months. Zaborowski. *Civil Engineering.* 604
Three new systems of prefabrication at LeHarve. Rojot. *Cahiers du Centre Scientifique et Technique du Batiment* ... 430
Ties — Railroad — Prestressed. Worontzoff. *Communication, International Congress on Prestressed Concrete* ... 523
Ties — Railroad — Prestressed concrete. Hubert. *Communication, International Congress on Prestressed Concrete* ... 794
Ties — Railroad — Prestressed concrete. *La Technique Moderne-Construction* ... 110
Torsion — Circular beams. Amaral. *Revista da Ordem dos Engenheiros* ... 107
Torsion — Marginal girders. Sager. *Beton- u. Stahlbetonbau* ... 277
Torsional stiffness of marginal girders in reinforced concrete floors. Sager. *Beton- u. Stahlbetonbau* 277
Transporting and storing loose cement. *Concrete and Constructional Engineering* ... 601
Trass—Mass concrete. Walz. *German Committee for Reinforced Concrete* ... 524
Tremie concrete. Hunicke. *Journal of the Franklin Institute* ... 433
Triaxial stresses — Concrete. Chambaud. *Annales de L'Institut Technique du Batiment et des Travaux Publics* ... 106
Trusses — Precast. *Concrete and Constructional Engineering* ... 429
Tunnel—Highway—Precast. *Proceedings, Deutscher Beton-Verein* ... 196
Tunnels — Hydro-electric — Scottish. *Concrete and Constructional Engineering* ... 109
Two prestressed concrete highway bridges in Sweden. Hildeberg. *Betong* ... 192

U

Ultimate design. *Proceedings, Deutscher Beton-Verein* ... 196
Ultimate resistance of prestressed concrete beams, The. Abeles. *Concrete and Constructional Engineering* ... 603
Ultimate strength theory for eccentrically loaded reinforced concrete columns. Cowan. *Magazine of Concrete Research* ... 357
Understanding and computing safety factor in reinforced concrete construction. Ros, Campus and Torroja. *Annales de L'Institut Technique du Batiment et des Travaux Publics* ... 192
Underwater concrete — Placement aids. Burt and Pritchard. *Civil Engineering* ... 695
Unique laboratory houses human centrifuge. Bagdoyan. *Civil Engineering* ... 699
Use of East Perth Power Station fly-ash as a pozzolan. Muntand and Munro. *Journal of the Institution of Engineers Australia* ... 279

V

Vacuum concrete. L'Hermite. *Annales de L'Institut Technique du Batiment et des Travaux Publics* ... 109
Vacuum concrete. Duriez. *Revue des Materiaux de Construction* ... 605
Vacuum concrete pavement. Leviant and De La Sayette. *La Technique Moderne-Construction* .. 278
Valved-tremie applied to subaqueous concrete structures. Hunicke. *Journal of the Franklin Institute* ... 433
Variation of wind velocity and gusts with height. Sherlock. *Proceedings, ASCE* ... 908
Vibrated concrete. Stewart. *Reinforced Concrete Review* ... 358

Vibration—Concrete compaction. Davies. *Magazine of Concrete Research* 698
Vibration—Effect on form pressure. Guerrin. *Cement* 280
Vibration — Surface — Slabs. Kirkham and Whiffin. *Magazine of Concrete Research* 795
Vibrator—Sieving. Hughes. *Engineer* 359
Vibrators — Concrete. Stewart. *Reinforced Concrete Review* 358
Vibrators — Concrete. Lindvik. *Teknisk Ukeblad* 189
Volume changes in sand-gravel concrete. Jackson and Timms. *Public Roads* 109

W

Walls — Dock — Lock. *Concrete and Constructional Engineering* 694
Warehouse—Prestressed concrete. *Concrete and Constructional Engineering* 105
Waterproofing. *Paint Manual* 694
Waterproofing concretes. Savoly. *Communication and Civil Engineering in Hungary* 521
Water requirement — Concrete. Plum. *Building Research Studies* 910
Wharf and tunnels at electricity works. *Concrete and Constructional Engineering* 432
Who invented prestressed concrete? Neumann. *L'Industria Italiana del Cemento* 108
Why prestressed concrete? Corning. *Civil Engineering* 699
Why Type II cement? Jackson. *Proceedings, ASTM* 698
Wind—Lateral forces. *Proceedings, ASCE* 106
Wind velocity—Design effect. Sherlock. *Proceedings, ASCE* 908
Winter concreting. Bohm and Drechsel. Wilhelm Ernst & Sohn 906
Winter construction—ABC. Danish National Institute of Building Research 431
Wire stress meter. Jung and Kretschmer. *Betonstein-Zeitung* 601
Wood fiber—Lightweight concrete. Levy. *Revue des Materiaux* 430

Y

Youtz-Slick method — Roof slab. Stewart. *Technical Bulletin, Housing & Home Finance Agency* 429

Z

Z-Charts—Construction. Johnson. *Nomography and Empirical Equations* 696
Z-D system — Shell structures. Eulitz. *Beton- u. Stahlbetonbau* 524